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Ref. CW 940

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3. Experience of on-line systems
4. Also desirable is experience on NCR equipment.

We would also be interested in talking to a Senior Programmer with relevant experience.

Ref: CW 941

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Required Profile:
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2. Knowledge of banking systems utilising on-line facilities
3. Also useful, but not essential, is a knowledge of NCR equipment.

Ref: CW 942

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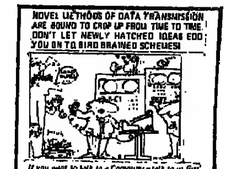
COMPUTER WEEKLY International

NUMBER 88 THURSDAY, NOVEMBER 9, 1978



INTERNATIONAL BRIEFING

Joint venture in Yugoslavia

YUGOSLAVIA is to acquire Western computer technology, and following establishment of a joint venture between Iskre and Control Data to manufacture the Cyber 18 minicomputer line under licence (CW, June 30, 1977), Honeywell Italia is now close to agreement with Elektronska Industrija, a Yugoslav electrical goods manufacturing undertaking, for a joint venture to manufacture the top six models of the Level 8 minicomputer line.

They will be built in Nis by a new company, El-Honeywell Informacioni Sistemi, owned 63% by EI, 30% by Honeywell and 7% by Honeywell's Yugoslav agent, Progres.

Amdahl installed

THE first Amdahl 470V/7 for American Airlines' Tulsa, Oklahoma computer centre, exclusively revealed in Computer Weekly (January 12), has now been installed, and the big internal US carrier has a second on order for next March. The machines will ultimately take over from the airline's two V/6s, but it will not become an all-Amdahl shop. Several 3030 series processors are reported to be on order from IBM.

Redifon for Tokyo

A THIRD Boeing 747 flight simulator has been ordered from Redifon Simulation by Japan Air Lines, for installation at the flight crew training centre at Haneda Airport in Tokyo. This sale brings the value of Redifon exports to the airline to almost £15 million.

Classic

TWO orders for Modcomp Classic 7880 computer systems have been placed by West German customers. Aachen Technical High School is spending $200,000 on a large system which includes two Modac III 7810 satellites and will replace a Xerox Sigma 3. The other customer is Brinkmann GmbH, a cigarette manufacturing company in Bremen, which has ordered a $100,000 system for tobacco research.

Japanese order

TWO of Univac's top-of-the-line 1100/60 systems have been ordered by Kawasaki Steel, the Japanese steel firm, to supplement the systems it runs on two Univac 1110s. Worth $15.8 million, the two computers are dual processor 1100/82 models, and will be used for sales and management information, and on-line control.

Printer finances

SECOND quarter revenues of $38,387,000 are reported by printer manufacturer Data-products Corp, representing an increase of 21 per cent over the corresponding period on the previous year. But income declined by 12 per cent, primarily due to heavy start-up costs on three new product lines.

European electronics market 'worth $48 billion'

THE total European electronics market for 1978 is predicted to be worth $48 billion in a new report*. Another report* covering a small part of that market, data communications, predicts a cumulative total over the ten years from 1977 to 1987 of $4.2 billion.

Meckintosh's Electronics Yearbook shows that computers and communications equipment are the two fastest growing sectors of the European electronics market, both showing a 24 per cent increase in 1978 over 1977. This is said to reflect innovation in product development and the penetration of computer applications into all parts of the economy.

In production of computer systems, the UK and West Germany are shown to be going from level pegging at $1 billion production in 1976 to Germany's production nearly 50 per cent up on the UK's in 1977. The predicted 1979 figures are $1.4 billion for the UK and $2.8 billion for West Germany.

The respective computer systems market sizes show a similar pattern, with the UK going from 81 per cent of Germany's 1977 value of $1.6 billion, to 58 per cent of its $3.3 billion 1982 figure.

The whole European electronics market was $41 billion in 1977 and is expected to grow by 17 per cent to $48 billion this year. In the early 1980s Meckintosh expects growth of 8 per cent a year, with the market reaching $62 billion in 1982.

Frost and Sullivan's report predicts that the European independent data communications market will peak and then begin to fall off by the early 1980s. This pattern is similar to forecasts for the US published last year, which predicted a peak of $1.2 billion a year before the fall-off began.

The report suggests that the build-up will be brought about in part by the diversification of devices taking the communications processing load away from mainframes. PTTs and value-added networks are increasingly using "node computers" to serve as concentrators and interfacing elements, as well as message switches and multiplexers.

*Meckintosh Yearbook of West European Electronics Data 1979. 140pp, price £75 or $180 overseas, from Meckintosh Publications Limited (CW), Meckintosh House, Napier Road, Luton LU1 1RG.

*Data Communication Equipment Market in Europe, report E220, 703pp, price £436 or $675, from Frost and Sullivan Limited (CW), 104-112 Marylebone Lane, London W1M 5FU.

Italian 'revolution'

ITALIAN cement company Cementir-Cementerie del Tirreno, a member of the IRI-Finsider group, has revolutionised its data processing procedures with the installation of a new computer system. It is based on twin Honeywell Level 62 processors and supports dozens of terminals in sales offices and factories.

The system is used mainly for real time processing of sales, shipping, billing and customer accounting data. An important benefit of the system is the way it helps the factories via the terminals, one of which is shown in our picture.

The control system in Rome transmits a delivery plan to the factories every day. The factories then use the terminals to transmit details of each loading, and a few seconds later the necessary shipping documentation is printed out.

Siemens launches 11 new models

IN the biggest single announcement of new computer systems since Honeywell's Series 60 launch in 1974, Siemens has announced 11 new models in three different ranges. The Fujitsu M-180 and M-200 systems have been announced as four models in a new Siemens 7.800 series; the company's long-established 7.000 series has been extended with models covering the IBM 303X machines; and a new office computer line, the Siemens 6.000 series, has been introduced.

The Fujitsu M-180 is announced in two versions, the 7.870 and the 7.872; and the M-200 as the 7.880 and 7.882. The top machine is claimed to operate at between 9 and 10 million instructions per second, compared with about 4 mips for the 3033. The 7.800 series is offered with Fujitsu's OSIV/F4 operating system, renamed Siemens BS3000. This operating system is claimed to offer almost full program compatibility with IBM's MVS, and to be some 20% more efficient.

Siemens' marketing target will be existing IBM users.

Siemens will get its first machine from Fujitsu next month, and deliveries begin next summer.

Marketing rights for the 7.800 series is held by Siemens in all European countries apart from Spain and Ireland, but is likely to concentrate on its home market in Germany to start with. The agreement was signed with Fujitsu earlier this year (CW, May 4).

Siemens' 7.700 line, which runs under the BS2000 and old BS1000 operating systems, has been extended with four new models. At the top, the 7.780 has been introduced to compete with the 3033, and the 7.770 to compete with the 3032. Both machines are set for first deliveries in mid-1980, and will have Siemens' own 64K-bit memory chips.

Two new versions of the existing top-of-the-line 7.760 have been announced. The 7.781 is 50% faster than the existing version, and the 7.762 is designed for applications where high reliability is vital.

There is no compatibility between BS2000 and BS3000 at present, but gradual convergence is planned. The first area to be tackled is in communications where networks of 7.000 and 7.800 processors are likely to be established.

A major challenge to the German small systems giants like Nixdorf, Kienzle and CTM has also been launched by Siemens with the new 6.000 series.

First models are the desk-top 6.610, an eight-bit business microcomputer, and the desk-sized 6.620 and 6.640, which are built around the latest models in Siemens' 300 line of process control minicomputers. Principal software offering on these is Simas, which Siemens hopes will turn out to be a superior product to MAS, Modular Application System. MAS is a comprehensive portfolio of accounting and general business software modules.

ICL wins £1.5m Czech orders

BUSINESS worth £1.5 million involving the sale of a 2964/50 and an upgrade of an existing System 4/72 has been won by ICL in Czechoslovakia.

The 2904/50 is for Prague City Council, which will use it for controlling the building and public works budget. A database using IDMS is to be developed.

The System 4/72 is at Prague University, and already supports four 2903s as terminals. The upgrade involves additional core and disc storage and enhanced communication facilities.

Datasaab close to sales deal with Univac

TALKS between Detesaab and Univac on marketing by the latter of the Detasaab D16/10 banking terminal series in some countries, are close to a successful conclusion, writes our Swedish correspondent.

The talks have been going on for 15 months, and involve joint bids in countries where Datasaab is strongly represented, and marketing by Univac where Datasaab is not active.

Univac collaborated with Detesaab on the bid for terminals to attach to the Univac 1100/80 mainframe ordered by Trustee Sevinge Banks in the North of England. This contract eventually went to Burroughs (CW, April 27).

Following the merger of the Detesaab division of Saab-Scania with Stanseab to form Datasaab AB, it has been found necessary to cut back the workforces in Sweden. At the former Stansaab company just outside Stockholm, 99 employees have been declared redundent, while 43 redundancies have been declared in the Detesaab offices in Linköping.

Nigerian stake

IN a significant departure from the company's usual practice, IBM is to take a minority 40% stake in a new Nigerian company, Deta Processing Maintenance and Services Ltd, formed to take over maintenance of IBM computers in Nigeria and to operate the company's bureaux.

Time to buy?

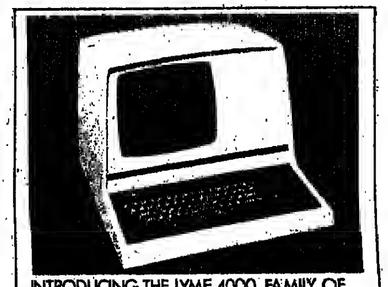
THE American public is being given its first opportunity to buy shares in Scientific Time Sharing Corp, best known for its APL timesharing service.

Over 800,000 shares are on offer at $9.50 each. The money will be used to pay off long-term debts incurred when buying computer equipment.

Under starter's orders

QUICK off the mark with a bid to secure one of the prestigious Moscow Olympics Games contracts is Computer Instrumentation Limited. The company took a Cilcom 1600 computer output microfilm system to a Moscow trade show last month and hopes as a result to secure an order for four of those systems.

The 1600 system uses 16mm film and 800 bpi tapes, and is capable of recording more than 50,000 pages of output in a normal working week. It could readily be used therefore, to process the mass of statistical data which will emerge from the many Olympic events.



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Phone phreaks spurred by home computers

IN the past, phone phreaks carried out their electronic mischief with the aid of red boxes, blue boxes and black boxes. But now, it seems, a new and much more formidable weapon has been adopted by these pirates of the wires. It is called a beige box.

According to the purists, the beige box is a computer terminal equipped with a modem, and it is named after the Model 33 Teletype, parent of today's computer terminals. More generally, a beige box may mean either a terminal or a personal computer.

The beige box may be used to access the Western Union telegraph network, telex circuits and certain satellite communications lines. A personal computer, enhanced with an interface capable of generating pairs of tones, can manipulate both the telegraph networks and the telephone system.

The reference to the use of a computer terminal for electronic pranks will appear in a forthcoming issue of TAP, the phone phreaks' newsletter. The report in TAP, according to our sources, was prepared by a knowledgeable phreak with considerable expertise in telegraphic communications. Should the phone phreaks choose telegraphic systems for their mischief, the effect could be catastrophic.

There are thousands of personal computers and computer terminals in the hands of Americans, and the number of systems is growing exponentially. It is said that it would take no more than 30 minutes to teach a computer buff how to access the Western Union nationwide telegraphs network, and to go from there across telex lines to the rest of the world.

The ease with which unauthorised persons can gain access to America's telegraph system is largely due to an oversight in the Western Union network. Dial-up numbers of Western Union's Infomaster computers are reported to be in the hands of many phone phreaks, and this facilitates access to the entire network.

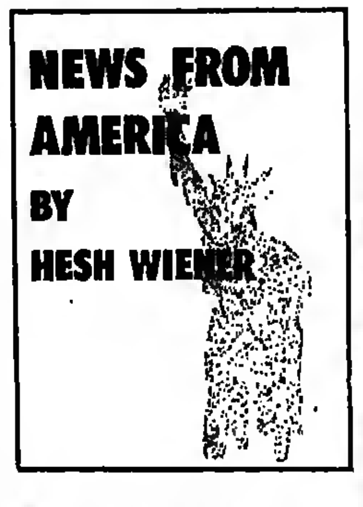
According to sources in the technological underground, Western Union's computer sends a signal to terminals that have dialled in that triggers an automatic answer-back code. This code identifies the terminal to the system for billing purposes. However, the Western Union system does not check whether an answer-back is valid; it only requires that some answer-back message of the appropriate length and format is received during a specified time period. Thus any answer-back may be typed on the terminal.

Even if Western Union checked the answer-back for validity, the company has no present of actually eliminating forged answer-backs. A phreak could key in the proper answer-back of any authorised user and gain admission to the network. In that case the user whose answer-back was used would be billed for the service.

Personal computers may be coupled to telephone lines via common acoustic couplers to simulate telegraphic terminals. With the addition of specific interfaces, however, those same computers may be used to simulate the operation of the telephone system's central switching equipment.

The frequencies used by telephone switching apparatus are well known in the underground. In fact, the frequencies of the signals and their uses are clearly described in telephone company technical papers that may readily be obtained.

Looking beneath IBM's impressive results



ECONOMIC concerns continue to plague investors, and despite indications that the computer industry, led by IBM, is shipping record levels of equipment, the Wall Street stock market remains tentative.

Of course, IBM's stock is of particular interest to big investors. The company announced record earnings for the quarter (CW, October 19), but the stock, which had risen earlier in anticipation of good news, dropped sharply.

While there is an old saw about the stock market always rising on fantasy and falling with facts, the real reason for IBM's dropping share value may have been investors' second look at the company's generally impressive figures.

"Most analysts saw the bottom line first," says Evans and Co's Eugene K. Collins, the prestigious firm's computer industry analyst. "Then we broke the numbers down and found that currency transactions made an extraordinary contribution to the gains."

The figures were indeed impressive: Revenues for the quarter rose 15 per cent to $5,380 million while earnings reached $815.8 million, an 18 per cent jump. (Last year's figures were $4,590 million and $690.4 million, respectively.)

And for the first nine months of the company's current fiscal year, IBM booked a profit of $2,100 million, up 9 per cent from last year's $1,920 million. This shows an impressive recovery from earlier quarters in which IBM profits slipped, a phenomenon attributed by stock analysts to the start-up of 303X shipments.

All this shows that IBM is a strong and growing company, able to introduce impressive products that slash the cost of data processing and somehow maintain great profitability.

But the catch comes in reported changes in IBM's income from currency transactions. The multinational lost $36 million in currency exchanges during the first nine months of 1977, and gained $99 million during the same period of the current year, a difference of $135 million that contributes directly to profits and losses.

Clearly money made or lost in currency transactions is no different from money made through the sale of goods or services. However, such money is not completely controlled by a multinational corporation; it is largely the result of currency fluctuations that result from international economic policies. Thus the falling dollar created a situation that contributed to IBM's profits so far this year, and IBM's only control over its reported income (or loss) would come from the rate at which the corporation chooses to repatriate funds from its overseas operations, a rate that itself may be determined by taxation policy and other regulations as much as by the policies of the company's management.

If the currency gains and losses are separated from other business figures, IBM's performance does not reflect the dramatic profit improvement that the reported bottom line figures indicate.

In the first nine months of 1977 IBM's profit was $1,958 million before currency losses; in the first nine months of 1978, the company earned $2,001 million before currency gains were added. Thus IBM's profits from the sale of goods and services did not grow 9 per cent from year to year but actually grew only 2.3 per cent.

This situation by itself will not cause investors to haul out of IBM stock, however, because the company's rate of sales is very high and the fourth quarter should reflect continued gains in both currency transactions and profits on sales. Further, the company may split its stock and further increase its dividend payout later this year, moves that would bring smaller investors into the ranks of IBM shareholders.

AN Apple computer, supposedly modified for use by phone phreaks, played a significant role in the latest drama surrounding John T. Draper, known as Captain Crunch.

Crunch on the Apple

Phone Phreak Crunch has been imprisoned again and is serving three months at East Pennsylvania's Northampton County Prison (pictured above) on charges of unauthorised use of telephone services resulting from his access to what is called a WATS extender.

A WATS extender is a telephone number that permits the caller to dial outgoing calls for a flat rate. It is used by businesses so that personnel may call a local number at the public dial-up rate and then dial an access code and a new number to get connected anywhere in the US.

Captain Crunch was on probation stemming from a previous phone phreaking charge when his arrest and conviction ensued. While the present charge does not involve phone phreaking, there is a possibility that Crunch's probation could be revoked, sending the Captain back to federal prison for up to 15 years.

When Crunch was arrested, according to phone phreak pholklore, AT&T went over his modified Apple II computer carefully. Phone phreak sources claim Crunch had developed some software and hardware that might be used by phone phreaks.

Crunch's software was complicated, according to sources from the underground, that AT&T scientists spent weeks trying to document it. The cost of analysing the software has been estimated in hundreds of thousands of dollars by underground technologists.

Whether AT&T spent that much and whether the company actually found Crunch's Apple capable of causing harm remains unknown.

Investors show their faith in computer business

VALUES of the shares of computer companies have done well this year, outperforming the stocks of just about every other industry and the stock market as a whole.

The faith that investors have shown in the profitability of the computer business is illustrated in a study published by Evans and Co, the brokerage firm. The figures below, drawn from a long list published by the brokerage, demonstrate how various computer companies have fared with investors. The Standard and Poor's Index used as a comparison is a broad indicator and includes the stock prices of 400 companies.

These selected mainframe and peripherals companies, with the exception of IBM and Burroughs, dramatically outperformed the market. Some of the best performers were companies whose fame rests in part on aggressive competition with IBM in the courts as well as in the users' offices.

It should be noted that the same companies whose shares grew so rapidly decline dramatically when Wall Street loses faith in computer companies. IBM and Burroughs generally suffer less from such a loss of confidence.

SHARE PRICES

Company	Dec 31	Sept 30	Per cent Change
S&P 400 Index	104.71	113.71	8.8
Amdahl	27 3/8	54 7/8	100.5
Burroughs	72 7/8	77 5/8	6.5
CDC	28 3/4	37 1/4	28.7
Cray	30 1/4	66	118.2
Honeywell	45 7/8	64 3/8	40.3
IBM	273 1/2	277	1.3
NCR	40 3/8	60 3/8	49.5
Sperry Rand	36 1/2	44 3/4	22.6
Calcomp	2 7/8	11 3/8	295.7
Centronics	17 5/8	35 1/8	99.3
Itel	20 1/4	32 1/4	69.3
Storage Tech	10 7/8	30 3/8	179.3
Memorex	31 3/4	48 3/4	53.5

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CORAL NEWS

The International edition of Computer Weekly dated October 12 incorrectly carried text from the first CORAL NEWS ...

The correct text appeared on October ... and copies are available from the Press Co-ordinator, NCC, Manchester.

Hitachi cuts risk with leasing policy switch

ANALYSIS of the marketing methods of Japanese companies in their home market indicates that the reported sales revenues of the Big Six Japanese mainframe manufacturers—Fujitsu, Hitachi, NEC, Toshiba, Mitsubishi and Oki — are not as firm as they seem, and Hitachi has now decided to do something about it.

In 1962, the Big Six set up a jointly owned leasing company, JECC, Japan Electronic Computer Co (CW, July 27).

JECC is funded with low-interest loans from government-backed financial institutions, and handles substantially all mainframe leasing in Japan, apart from IBM's own business there.

When a provisional leasing contract is signed between a manufacturer and a customer, the manufacturer sells the machine outright to JECC and marks the transaction down as a sale in its books. This is attractive to the manufacturer, in that he gets cash in hand at once, and convenient for the user, in that he deals with one large and reputable finance company.

However, there is a major snag. If the customer terminates his lease before the prescribed period, the manufacturer is required to buy back the machine at a substantial proportion of its original selling price. The Japanese manufacturer is therefore compelled to go for extremely rapid growth in sales in order to keep ahead of the game; and, in Fujitsu's case in particular, resorts to aggressive price-cutting to keep the new business coming.

Thus, although Fujitsu's estimated 19% of the Japanese market is not far off IBM's estimated 24%, Fujitsu's annual revenues of some 240,000 million yen are much "softer" than IBM's 300,000 million yen, since the IBM figure is actual on-going rentals received, whereas Fujitsu's contains a significant element of money received for machines which it might have to buy back at any time.

Hitachi, with annual computer sales of about 170,000 million yen, has recognised the risks involved in this exposure, and has switched to a policy of financing many of its rented machines internally, rather than through JECC; 50% of its sales are now financed in this way.

Some observers in Japan believe that this is evidence that Hitachi has a better understanding of the computer business than its competitors, and that in the long-term it is in better shape to survive than its partner in the M-series, Fujitsu.

Hitachi's semiconductor technology is particularly highly regarded in Japan, and the company is a giant, with computer business accounting for only 15% of its total. Fujitsu's computer business, on the other hand, accounts for about 70% of turnover, so the company has to succeed in the computer industry to survive. Normally regarded as a strength, this could turn out to be a mortal weakness if too many contracts with JECC were to turn sour.

Even if Fujitsu failed, it is unlikely that this would have much effect on its US partner Amdahl. After using Fujitsu as a springboard to get its production up and running, Amdahl has been transferring more and more of this back to California and now depends very little on Fujitsu.

On the other hand, if Hitachi lives up to the expectations of Japanese industry observers, it will prove a very significant partner for Itel, which is entirely dependent on Hitachi for its large systems.

FOLLOWING the agreement between SIS Software and Toppan Moore of Tokyo under which the latter will market the SIS-MIDA International banking system in Japan (CW, September 14), two Japanese salesmen, Mr Matshushita and Mr Asada are visiting London to learn the ins and outs of the software, which runs on IBM System 32 and System 34 computers. The picture shows them studying a printout.

German firm builds CPU round micro

STARTING OFF with products built around the Data General Nova mini and the Motorola 6800, German small business computer manufacturer David Datentechnik has now moved on to build its own processors using the AMD 2901 bit-slice micro.

The new processor, used in the DDC 200 model, retains compatibility with the company's existing software by including the Nova instruction set, but additional instructions are used to improve Cobol performance and for memory mapping.

Marketing is entirely through agents and dealers, and the company does not get involved in writing application software. It has outlets in Germany, France, Italy, Spain, Austria, Denmark, the Netherlands and Belgium, but none at present in the UK. It is projecting sales worth 55 million Deutschmarks, £15 million at end-user prices for the current year, having started in business only three years ago (CW, April 28, 1977).

The new processor takes 32 to 84K-words of main memory, using 16K memory chips, and supports from one to six intelligent workstations, which are built around the M6800 micro and are available in a stand-alone version as the DDC 110.

The company claims that use of the bit-slice micro enables up to 50% better performance to be achieved by adding instructions, without changing the cycle time or the basic central processing unit. In addition it is possible to turn the CPU into a specialised Cobol or Basic machine without altering the design artwork, simply by using different microcode.

The DDC 110 is backed by floppy discs, and includes an indexed sequential file management system, and has a Basic compiler which is claimed to be 40% faster than an interpreter would be, which includes enhancements for applications like order processing.

David Datentechnik continues to use the Data General Nova at the top end of its line, and is planning to adopt the AMD 2903 "superslice", a 4-bit bit-slice three to four times more powerful than the 2901.

US business group emphasises privacy

IN an effort to "raise the consciousness of business on privacy issues," the US National Chamber of Commerce has adopted a revised privacy policy. The new statement urges all 77,000 member businesses to implement voluntary safeguards and controls over the personal information each company collects in the course of doing business.

The chamber's new policy statement, the result of a 10-month effort by the group's privacy committee, closely follows recommendations put forward in last year's final report of the Privacy Protection Study Commission. It says the chamber supports "voluntary programmes by business as the primary means to assure and protect individual rights in business and professional transactions."

The foundation of "an effective privacy protection policy," the statement reads, rests on three overall objectives.

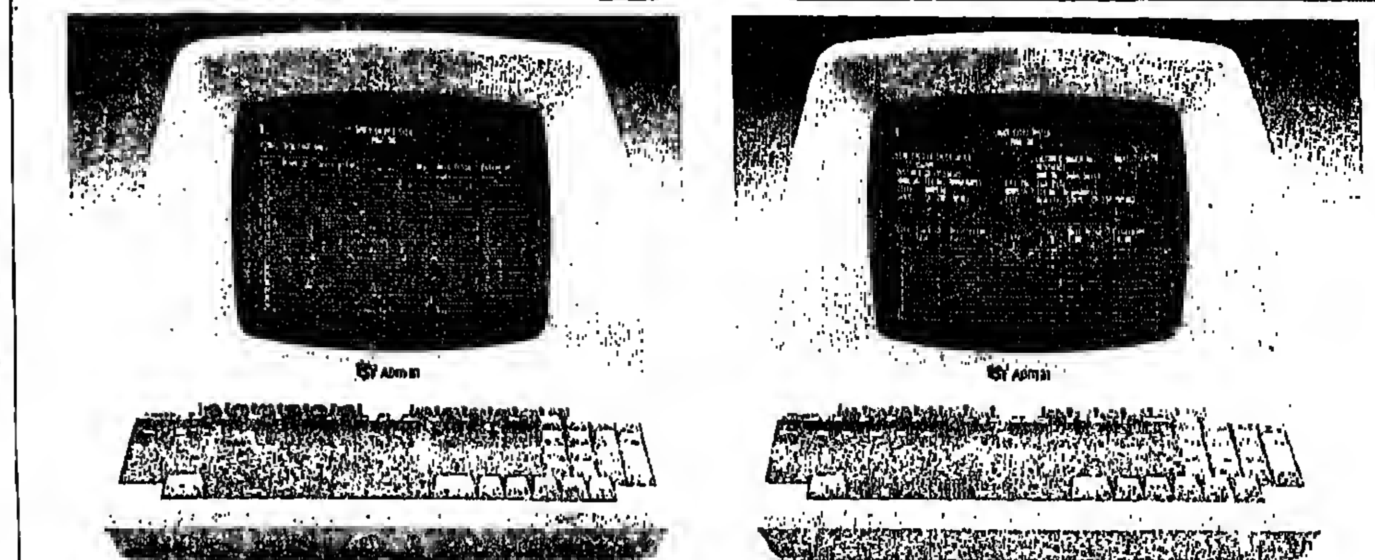
The first is to minimise "intrusiveness" by establishing a proper balance between what a "data subject" is expected to divulge to an organisation and what that individual can expect in return in terms of privacy protection.

The second is to maximise fairness, through providing open access for data subjects to their personal files in a way that will minimise the amount of incorrect, outdated or unnecessary information maintained by the record-keeping organisation.

The third is to create "legitimate and enforceable expectations of confidentiality" by defining and publishing the recordkeeping organisation's obligations regarding the use and disclosure provisions of personal data that is maintained.

Crop monitor

DESPITE reports that the order had been cancelled (CW, July 13), an ES1040 computer from Robotron of East Germany has been installed at the Iraqi Centre for Agricultura and Agricultural Reform. It is used to monitor soil quality, water supply and fertilisation and compile statistics for planning livestock farming, crop cultivation and storage.



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Monsanto invests $2.5m in system to monitor employee health

THE giant chemical company Monsanto Corp expects to pour $2.5 million into a new computer system that will monitor the health of its 50,000 employees.

Monsanto will feed into the computer employee medical histories, employee exposures to specific chemicals, and even data relating to the more than 30,000 materials the corporation makes and uses at its 200 plants across the US.

The new computer system will also store data in a format to fit the reporting requirements of such federal agencies as the Occupational Safety and Health Administration, OSHA, and the Environmental Protection Agency, EPA.

The computer will also allow Monsanto to provide the US Congress and regulatory agencies with much more meaningful data than is now available, the company claims.

By closely monitoring employee exposures to various chemical substances, Monsanto hopes to be able to detect any possible relationship between the exposure to specific chemicals and early signs of disease or health hazards.

"The system will enable us to see very early on if any possible problem areas are beginning to develop so that we could take prompt action to protect the health of our employees," says Don Bishop, director of environmental communications at Monsanto.

Besides protection of employees' health, Monsanto hopes to realise other benefits from the information system. "The regulatory agencies are going to start requiring even more detailed records than we must presently provide, and obviously a system that will enable us to retrieve this data rapidly and in proper form will save us time and money," Bishop claims.

The Monsanto spokesman adds that a number of organisations in private industry and in the government have already inquired about the company's plans to computerise employee health data. "It's a system that makes sense," he says.

Martex 79 exhibition

COMPUTER users from all over Europe are being invited to attend Martex '79, described as Europe's first exclusive exhibition for the leasing and second user market.

Martex '79 takes place from March 6/8 at the Felbridge Hotel, East Grinstead, Sussex, which can be reached easily by road or rail from London and by bus from nearby Gatwick Airport.

Exhibitors at Martex '79 will comprise leasing companies and used computer vendors from the UK and the Continent.

Full details of the event can be obtained from the organisers, Walker Ellis Ltd, 64 Dundonald Road, London SW19. Tel: 01-543 1148.

COGARVIEW

Leasing: the great entrepreneurial days are over

THE launch of IBM's new 303X range has been accompanied by a chorus of bullish and, I fear, unwarranted prognostications by the leasing companies — those that survived through the lean mid-seventies, that is.

It is said that drowning men will clutch at any straw.

The insistence of the leasing men that the 303X will turn out to be as long-lived as the 360 seems to me to be a case of wantonly wishful thinking. No one with an ounce of business in his soul would deny them the chance of a second bite at the cherry, but if I turn my eyes to the horizon I see no latter-day Saul Steinberg striding towards the Chemical Bank.

Lessors always were gamblers, despite the wash of respectability provided by the massive profits and overnight empires of the late sixties and early seventies. They gambled essentially on the pundits being wrong when they talked of the "rapid pace of technological innovation" and so forth.

In the particular conditions of 1968-1972 they were right. But to repeat the same coup in the almost opposite environment of 1978-1982 is about as likely as a sighting of Halley's Comet.

In my view the great leasing boom was a product of a rare conjunction of factors, possibly unique to the period and certainly not now to be seen. Foremost were, of course, the advanced design of the 360 and IBM's pricing policy.

In retrospect it is possible to speculate that IBM did not immediately realise to what it had given birth with the 360. They knew, of course, that a new dimension of performance had been achieved, but without a substantial installed base over several years they could only guess at the reliability and longevity of the range.

With System/360 IBM had reached a plateau. They were way ahead of the game, as the range's immediate identification as a new generation recognised. They have never since been so spectacularly innovatory.

The plateau was mistaken for a minor peak by almost everyone but the leasing men. It was assumed that 360 was the first of a quickening series of developments whereas, if anything, it was the last major development until the emergence of the micro. The lessors bet IBM and everyone else that 360 would have an economic life way beyond even its manufacturer's wildest dreams, and so sceptical was IBM that it failed to devise a protectionist pricing policy. That is not a mistake it has made since.

But much else was running in the favour of leasing at that time, too. In the first place it was the end of the — as yet unforeseen — end of a prolonged spending spree. The world economy was awash with investment capital. Computers were selling as fast as new model numbers could be thought up.

Then, too, the leasing companies were filling an unrecognised gap. Traditional sources of finance were cautious of the new technology; they were weary of the speed of obsolescence over the previous decade and unconvinced of the underlying growth rate of the industry.

Four years later, at the end of the nominal life of a 360 by IBM's 1969 calculations the world has been plunged into a depression. Credit was tight, capital virtually non-existent. Users were four years more mature. The gloss had worn off the generation game.

It had become almost a universal view that if a system worked there was no longer so much to be gained by turning it in for something slightly larger or slightly more sophisticated. Salesmen's claims were regarded with scepticism. The leasing companies' belief that a 360's life-span was nearer 10 than four or five years was looking about right.

How many, if any, of the conditions existing in the late sixties or early seventies are apparent today though? Instead of coming to the end of a boom, with a recession just around the corner, we are just coming to the end of a recession; and only an optimist would so far predict that a boom is just around the corner.

There is more capital around than for several years, but nothing like the profligate wealth of the 1960s. The computer industry has become public property. It is fully understood by the banks and finance houses — indeed, it is they who underpin most of today's leasing business.

More fundamentally, though, I do not see the 303X range as another 360. It is a step forward in the state of the art, fair enough; but not such a large one as to inspire a confident prediction that we have reached another plateau. Rather the reverse. The potential of the micro, looming over the whole industry like Damocles' sword, has created an environment of flux in which firm predictions can be [illegible] about the short-term future.

I realise that I am in danger [of] pontificating about the pace of innovation in just [the] way that proved so mistaken [some] years ago, but this time the[re is] plenty of evidence to back [it] up.

All this is not to say that [there] will not be some good [leasing] business done over the [next few years on the] competing new ranges. [But the] nature of the business [has] changed. Most leasing [now] goes through the comp[anies] that are selling the equip[ment]. The bigger manufacturers have their own leasing [com]panies, operating effectively [on] credit lines from the b[anks], using their lease base [as col]lateral. The arrangement [is suf]ficiently flexible that [vari]ations from month [to month] are accommodated with[out ...]. Leasing money remains [avail]able as long as cash-flo[w is] firm and off-rent does[n't ...] widely over a period.

The banks — [...] ahead where floating [...] rates are concerned — [have be]come sophisticated op[erators in] the leasing market. There [are all] sorts of leasing options [available] now. Sometimes the lea[se] stream is sold to the bank [for] up-front cash, but the resi[dual] value remains with the less[or]. Sometimes there is dou[ble] leasing, with conseque[nt] balance sheet problems.

The leasing companies [are] pinning a lot of faith on the [...] of IBM's predicted rent and [...] base of 303X machines to [...] them against obsolescence [...] less optimistic. The chance [of] another new IBM range in [the] early 1980s is a considerable [one] and if it is accompanied by [the] sort of price-cutting co[...] that the 303X prompted [...] a lot of fingers are in d[anger of] getting burned.

US rise in DP balance of trade

THE US balance of trade for computer and business equipment, including copiers, continued to rise favourably during the second quarter of 1976, according to statistics released by the Department of Commerce.

The industry had a healthy 22.7 per cent positive increase in the balance of trade for the second quarter of 1976 over the corresponding period in 1977. But that is a smaller increase for the second quarter than the industry enjoyed overall in 1077. Year-end figures for 1077 revealed a 27.1 per cent increase over 1976.

The second quarter of 1978 showed a positive balance of $078.9 million while the same quarter of 1977 had a positive balance of $553.5 million.

Although exports rose 31 per cent from $940.3 million to $1,232.3 million, imports were up 43 per cent from $366.9 million to $553.4 million. The greatest product area of increase [...] was data processing [...] which rose from $30[...] $52.5 million, or 72 per [cent]. [In] addition, imports of [...] machines rose 68.3 per [cent] [...] non-data processing [...] rose 45 per cent and [...] of parts was up 28.7 per [cent].

Parts and accessories [...] processing machines [...] equipment were the [...] items. They rose 67 [...] $358.8 million.

CDC venture survives in Iran

● From front page

equipment worth $2.6 million for Iran's Electronic Components Industries project to establish a national semiconductor industry. Before the latest outbreak of rioting and strikes all four systems were running, but no word has been received since then.

IBM suspended order-taking in Iran following a dispute with the government about 16 months ago, and has been involved in protracted negotiations to resolve the problem.

"We have a small number of non-Iranians employed there, but in view of the continuing unrest, the majority have been temporarily withdrawn," a spokesman told Computer Weekly.

Stepping into the IBM breach, Iran sold two of its IBM-compatible AS/5s to the Iranian health ministry and the company is continuing active operation in the country.

Honeywell has seven Italians and one American who have chosen to carry on working in Iran, where Honeywell [is a ma]jor supplier of defence [...]

ICL's plans for [...] small computers in Iran [...] through. In August [...] when the business [...] to act as ICL's agent [...] mind.

Scicon, which [...] major project to com[puterise ...] law and designing [...] tion retrieval system [...] of the Prime Minister [...] nounced earlier this [...] was withdrawing from [...] lowing disputes [...]

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NEWS FROM SOUTH AFRICA

US donates cancer recognition system

Esmond Frank reports from Cape Town

A COMPUTER system capable of classifying cervical cancer cells has been donated to the South African Medical Research Council in Cape Town by Professor Peter Bartels, professor of microbiology and optical sciences at Arizona University.

Professor Bartels, who developed the programs, says the system is used mainly for cell recognition in cervical cancer smears.

The system has so far been installed only at one other centre outside the US.

"Images of the cells," explains Professor Bartels, "are processed by an ordinary light microscope with a scanning device. This converts the amount of light passing through a standard, prepared series of cells into a display of numbers, which are then manipulated by the computer program to give relevant, measurable characteristics of the cells, which are analysed for normality or abnormality."

The process, he says, changes clinical cytology from a question of subjective assessment into a mathematical model which can be reproduced on magnetic tape which can be sent around the world.

"By adding the use of the computer, we are extending our ability as physicians to perceive what is going on in the human body and adding to our ability to produce a correct diagnosis."

Professor Bartels claims that malignant cells can be differentiated with 85 per cent accuracy by putting the readings from the system into a mathematical formula.

The South African Medical Research Council will initially be linked by telephone to Arizona University's computer, which will provide digital results from South African input in the form of print-out or on a video display screen, says Professor W. A. van Niekerk, the Council's director of clinical cytology research and head of the department of obstetrics and gynaecology at the University of Stellenbosch in the Cape.

The package, he adds, will later be placed on a local computer.

Dr S. A. Fellingham, director of the South African Institute for Biostatistics, says the system, which took 60-man years to develop, will be used to interpret and analyse statistical data — a task which previously took several hours — in a few minutes.

Training of blacks welcomed

A DECISION by the Careers Development Project of the US-South African Leadership Exchange Programme to sponsor the training of black computer programmers has been welcomed by the South African computer industry, which is currently suffering from a chronic lack of trained personnel in all areas.

The training will be undertaken by CIM-Deltak, a company in the Johannesburg-based Fine Spamer group, which specialises in the multimedia training of data processing personnel. Fine Spamer is a member of the worldwide BIS group.

Suitable black people, according to a spokesman for Fine Spamer, will be trained on a course specially developed by CIM-Deltak and which makes use of internationally recognised ANSI Cobol programming series.

TO enhance the management of its air freight operations, Cargolux Airlines International has ordered a CII-Honeywell Bull Level 64/50 system, which will join a 64/40 at the company's data processing centre in Luxembourg. Cargolux will also use the two machines to aid maintenance of its fleet, which comprises two Canadair CL44s five DC8 Super 63s, and in the near future, a Boeing 747.

Once fully operational the systems will allow Cargolux' affiliates around the world to link up and exchange data, and transactional application programs will use the IDS II database management system and Transaction Driven System software.

● Our picture shows the signing of the contract for the second Level 64.

US study boosts East-West trade

THE Brookings Institution, a private commentator on government affairs, located close to the White House, has recommended that efforts to trade with the Soviet bloc and China in high technology items be increased.

The study covers East-West trade in general, but specifically analyses trade in computers and other technology products.

While there have been responsible arguments that the East gains more from this trade than the West, Brookings believes that no one can determine with certainty whether trade damages Western dominance in economic or political matters. Brookings instead believes that trade in itself provides clear benefits to all parties.

Acknowledging that trade in computers appears to provide a multiplier in economic gain (through increased productivity and better management) for the East, and pointing out that computers may be critical to certain defence objectives, such as anti-ballistic missile systems, Brookings nevertheless believes that the potential risk associated with East-West trade in data processing equipment and knowledge is not great.

The planned economies, according to the study, do not generally gain as much from the use of individual computers as free enterprise nations.

ICL launches hotels registration and accounting system

AN hotel administration and guest accounting system, HAGAS, has been launched by ICL in South Africa in an attempt to corner a market estimated to be worth more than £11.7 million.

Brian Wachsberger, marketing manager of ICL's professional services division in South Africa, says that about 100 hotels in the country have 150 or more rooms which could justify installation of the system.

This market alone, he believes, could be worth as much as £6 million.

He adds that hotel groups with central reservation facilities could account for additional sales worth more than £5 million.

The system, of which only five have so far been installed in the UK, is an online real time system based on the System 10.

HAGAS provides check-in and registration facilities, reports on expected arrivals, room status and room verification.

Wachsberger says South African hotels are showing increasing interest in computerised systems because of the difficulty in recruiting suitable staff and the dramatic decrease in the price of hardware as well as the fact that ageing electromechanical accounting equipment needs replacing.

He believes that HAGAS could increase hotel occupancy by up to 5 per cent.

Exodus of experienced DP staff 'ominous'—survey

EXPERIENCED computer staff are emigrating from South Africa at an "ominous" rate, according to a survey carried out by a staff consultancy, Computer Personnal. Its 1976 salary survey for South Africa shows that 80 systems development staff, or 4% of the total in the country, left over the last year.

Some of these are expatriate Britons returning to the UK, but a good many are South Africans moving permanently to Australia.

A sizeable number of skilled computer staff are coming into South Africa from Rhodesia, but it appears that many are using South Africa simply as a stepping stone on their way to Australia.

South African DP is experiencing rising staff shortages and high turnover, like other countries. Vacancies for analysts have gone up this year to 22.4% from 19.5%, and for programmers to 19.3% from 11.2%.

First 2950 installed

THE first ICL 2950 to be sold in South Africa has been installed at the Cape Town head office of the Southern Life Association, one of the country's largest insurance companies.

Valued at £706,000, the system includes 1 Mbyte of main store and six 200 Mbytes exchangeable disc stores.

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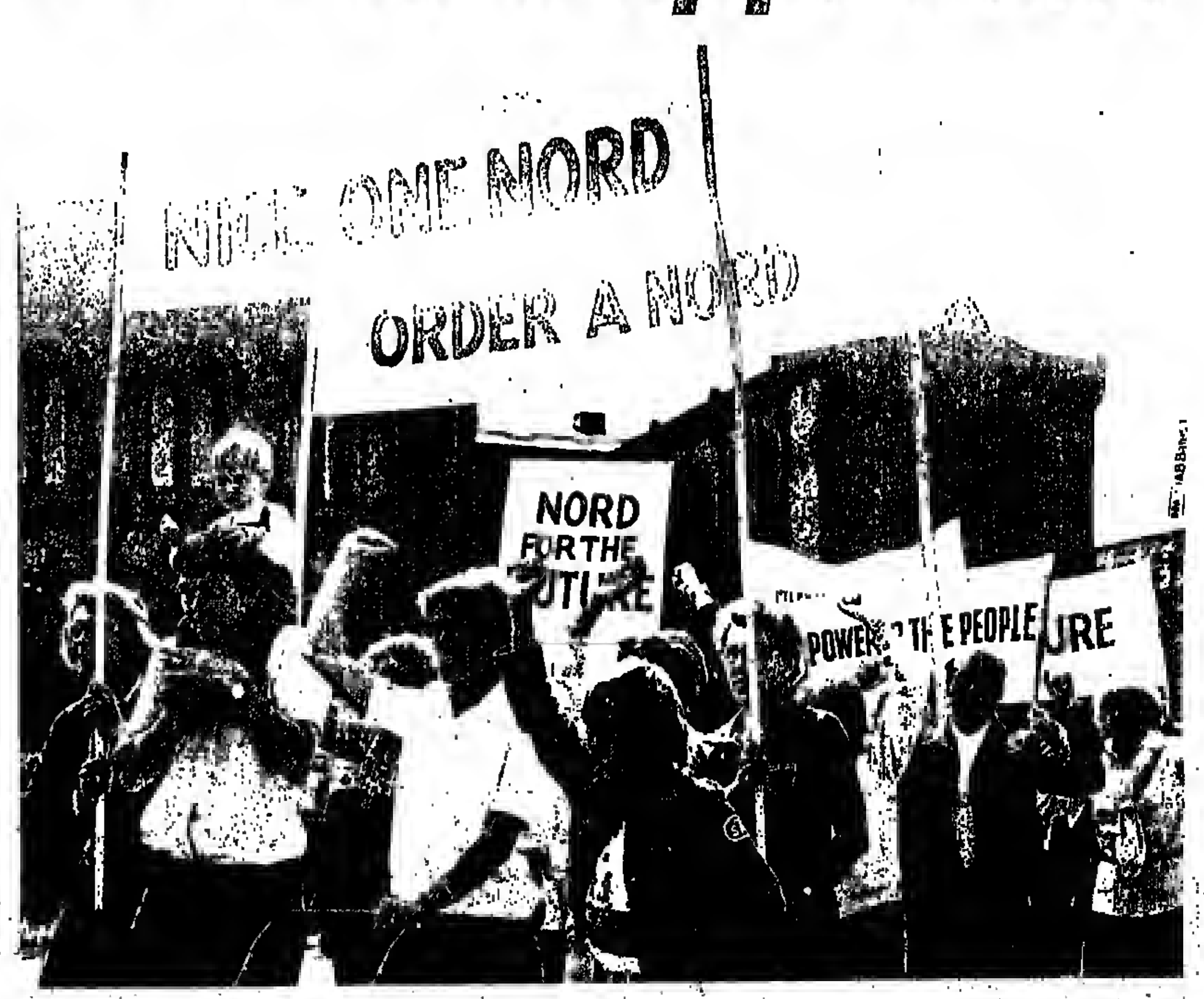

A new trend dominates DP: decentralised systems compact and rugged enough for your own office. How do you keep up with these rapid developments if you are stuck with a mainframe?
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FRED LAMOND'S MARKETVIEW . . . . ON THE IMPACT OF THE 8100 SYSTEM

Distributed processing goes into Orbit at last

WITH the announcement of the IBM 8100 system, previously code-named Project Orbit, last month, IBM's Systems Products Division has at last followed its rival General Systems Division in announcing a powerful locally programmable distributed processing system with large file storage, that can be integrated within an SNA network.

The first 1979 deliveries of the new 8100 system will coincide with the opening of new circuit and/or packet switched public data networks in most European countries, which will probably be followed by a substantial raising of the charges for private leased lines.

In this Marketview, Fred Lamond assesses the probable impact of both these developments on the processing patterns of large IBM users, notably those who like to remain within the IBM mainstream. He examines also the extent to which they strengthen, or weaken, the case for adopting IBM's Systems Network Architecture. Lamond is European Editor of the Auerbach Computer Technology Reports.

IN his seminar on database design in London in December, 1976, James Martin, then a fellow of the IBM Systems Research Institute, predicted that "the current trends towards distributed processing will dominate the industry within two years".

No trend can be said to "dominate the industry" unless IBM participates in it. Dr Martin's prediction was thus generally understood to be a veiled warning to all the DP managers with IBM systems that IBM would shortly drop its Canute-like attempts to help them stem the tide of proliferating minis in their organisations, and would announce some powerful locally programmable distributed processing systems of its own.

Both sides of IBM have now done so within James Martin's timescale.

Early in 1978, the General Systems Division announced the availability of SNA compatible SDLC protocols on its Series I, System 34 and 5110 computers from mid-1979 onwards. Now the Systems Products Division in its turn has announced the locally programmable 8100 as successor to the earlier 3790 communications system, which depended on its host 370 or 3030 for all its local programs.

Yet IBM would deny that it is a recent convert to distributed processing. It would claim that it has promoted distributed processing among its users for over ten years, first with the hard-wired 2741 teleprinter and 2260, 2265 and 3270 series displays, and more recently with the intelligent 3600 Finance, 3650 PoS and 3790 general purpose Communications Systems and the Systems Network Architecture announced four years ago.

It all depends, of course, how one defines "distributed processing", that most ambiguous of data processing buzzwords.

End users of data processing services are primarily interested in *distributed access* to processing power and computer-held files via online data entry and data collection terminals in the offices and workshops where source data originate, inquiry terminals on the desks of managers and other staff, and remote printing terminals in the locations where computer output is analysed.

Such devices and online connections have indeed been offered by IBM and most other mainframe manufacturers for over ten years. What has changed during the intervening period is the location of the processors to which these distributed terminals are connected.

The earliest networks connected these distributed terminals directly to a single centralised DP mainframe, that was also responsible for all batch processing. It is a network structure still widely used in the US, where competition among common carriers has kept the cost of leased lines down and their reliability high. But it has never been widely adopted in Europe, except for purely local networks within a single office, university campus or factory domain.

Long distance communications lines provided by the monopoly European PTTs on the other hand, have been both too-expensive and insufficiently reliable to make the work of remote offices and factories dependent on dumb terminals connected to them. Some local processor intelligence at each factory or office site on which there are online terminals has been the European norm, especially among the European banks that have pioneered data communications networks in Europe.

The continuing drop in the price of minicomputers and microcomputers during the last ten years has led to a proliferation of these systems on both sides of the Atlantic, both among small businesses and among large corporations and institutions. Among the latter, they have been mainly used, however, to implement new free-standing self-contained applications, rather than for the decentralisation of the older invoicing, stock control, payroll and similar applications from the centralised batch processing systems.

The coming year will see a radical change in the European data communications environment. New public packet switching digital data networks will be opened successively in France (Transpac), Belgium, Netherlands and the UK (PSS), while the four Nordic capitals will be linked by the first links in the new circuit switched Nordic Public Data Network.

Examples include the ICL 2903 and other business minis used by some UK banks for foreign exchange accounting, dividend calculation and distribution, while customers' current accounting remains centralised on two or more large mainframes at a single or at the most three sites in the whole country.

This pattern of distribution of processing power is more properly called dispersed processing.

The term distributed processing on the other hand, is increasingly reserved to systems in which the different processing stages of a common task are divided between a central mainframe and local data entry or order entry transaction processing minicomputers in each sales office or factory.

As orders are received by mail or over the telephone at local sales offices, they are entered on the keyboards of local data entry terminals. A local processor controlling these terminals performs data entry validation in real time, and may even consult local files in real time to check that the items in the order are in stock, or that the customer placing the order has a valid account and is up to date with his payments. Similar online data entry procedures take place at factories as manufactured products are completed, and at warehouses as new stocks are delivered.

Once local orders, stock deliveries and production data have thus been entered on local systems and validated, they are transmitted to the main central system for updating the main files, and performing subsidiary processing of by-product data. The outputs of such centralised processing will then again be transmitted to the local processing systems of the sites where the outputs are required, and these local minicomputers will do the required formatting and printing.

The crucial factor in all such distributed processing systems is the speed of interaction required between the local data entry and the central file processing system. If all the stocks, accounts and other files that have to be interrogated in real time during data entry can be held on the local processing system, there is no problem. Locally entered data can then be transmitted overnight in batch mode to the central DP system by whichever transmission method is cheapest:

- On diskettes or magnetic tape reels transported by company van or Datapost; or
- Via an online data communications link, using either the company's own private voice communications network out of office hours, or the Post Office's Midnight Line Facility on the switched public telephone network.

In either case, the cost of overnight batch data communications is limited to the amortisation or rental cost of the modem (£200 per year on the Midnight Line Facility) with no volume charge for the data messages or the connection time. The simple IBM 2780, 3780 or HASP BSC communications protocol is quite adequate for such temporary switched point-to-point circuit connections.

Complications arise only if one or more of the files that have to be interrogated in real time during the data entry process, or at any other time, have to remain centralised. This is the case, for instance, of stock files on high value infrequently ordered items for which stocks are held in a single warehouse serving widely dispersed sales offices throughout the country. As each order originating from anywhere updates the file by diminishing the number of items remaining available for subsequent orders, the file cannot be duplicated among the local processing systems, but must be interrogated in real time over a long distance data communications link during peak hours.

European data communications users outside France and West Germany have hitherto been able to choose only between the switched public telephone and telex networks on the one hand, private leased telephone and telegraph lines on the other, for their data communications links. Temporary dial-up telephone and telex circuits are unsuitable for real time file interrogation applications, even when these are infrequent, because it can take up to 15 seconds to set up a dialled up connection on the Strowger telephone or telex network, and the Post Office does not allow auto-dialling by computers and terminals on this network.

By default, therefore, only leased telephone and telegraph lines have been suitable for real time file interrogation applications, and the rental for these is wholly distance and quality dependent, and unrelated to the frequency of their usage. If a permanent telephone line thus has to be leased anyway for occasional stock file inquiries on infrequently ordered high value items, it costs no more to use it also for all stock files inquiries, unless the volume of these is such that a second or wider bandwidth line would have to be leased to cope with these as well. Only companies which require a private leased line network also for voice communications have found it economical to restrict their long distance data communications during business hours to real time inquiries interrogating files that have to be centralised from a systems point of view.

As a result, few European data communications users have hitherto distributed their interactive database files. Where any part of a database file had to remain centralised for systems reasons, the whole file has remained centralised as well, and has been interrogated at a distance by local processing systems.

The old IBM 3790 Communications System, like the 3600 Finance and 3650 PoS terminal systems, was designed for just such an environment. It had local 10M to 30M byte disc storage capacity, which was adequate for screen formats, data validation files and temporary files of entry and remote batch output data. But it was assumed that any interactive main files that the system would have to interrogate during data entry would be held on its host 370.

The coming year will see a radical change in the European data communications environment. New public packet switching digital data networks will be opened successively in France (Transpac), Belgium, Netherlands and the UK (PSS), while the four Nordic capitals will be linked by the first links in the new circuit switched Nordic Public Data Network, akin to the West German EDS network that has been gradually expanded since its opening in August 1976.

Whether they are circuit switched or packet switched, these new digital data networks will all allow auto-dialling of temporary circuit connections by host computers and terminals, and the connections will be set up in under one second. They will be suitable, therefore, for infrequent real time file inquiries, as the old circuit switched public telephone and telex networks are not because of their long analogue dialling times.

Steer clear of SNA for long distance datacom links

The European PTTs have spent substantial capital sums on these new digital data networks, on which they will earn a return only if they are intensively used by data communications users. In order to encourage such use, the PTTs are widely expected to raise the rental charges on leased telephone and telex lines, although the French and British Post Offices at least have disclaimed any intention of making these charges usage dependent, at least as far as single user private networks are concerned.

At the recent ISL conference on Post Office Data Communications — the Way Ahead, a PO Telecommunications HQ spokesman predicted 10 to 70 per cent higher rental charges for leased telephone circuits in Britain as soon as the current price freeze on Post Office charges is lifted.

In this changed data communications environment, it will become increasingly advantageous for large companies to distribute their interactive database files to the sites where they are interrogated in real time, and to retain at the main DP centre only those portions of interactive database files that are interrogated and updated in real time from any of a number of geographically dispersed sites.

In this changed data communications environment, it will become increasingly advantageous for large companies to distribute their interactive database files to the sites where they are interrogated in real time.

Such *distributed* interactive *processing* requires sophisticated software on the local distributed processing satellite systems. This was pioneered over three years ago by Four Phase Systems Inc on its multi-workstation System IV, which it now sells also in the UK and which is marketed on the Continent and in Scandinavia by Philips Data Systems under the label P7000. Each System IV workstation can interrogate and update in real time any file record held either on the System IV processor's own disc backing files, or on the files of a host IBM 370 at the same or a remote site.

At least eight other business minicomputer, intelligent terminal and data entry system manufacturers active on the European market have followed Four Phase Systems' lead in the last 12 months (see Table). Now both IBM's General Systems Division and its Systems Products Division have done so as well.

With backing disc storage expandable from 23M to 320M bytes, the new IBM 8100 Information System is clearly designed to hold not only data entry and validation files, but also interactive local databases. But like its predecessor, the IBM 3790 Communications System, and the Four Phase System IV, its terminals can also interrogate and update interactively the files of a host 370 or 3030, whether running under DPCX in 3790 compatible mode, or under the native DPPX operating system.

In its control of locally connected terminals, the IBM 8100's DPPX mirrors SNA's hierarchical polling star network architecture. But contrary to first impressions, this does not strengthen the case for general adoption of SNA for IBM users' primary long distance data communications network between 8100 local sites and the host 370 or 3030.

Unlike its predecessor, the 3790 Communications System, the new 8100 Information System can communicate with its host 370 or 3030 not only in SDLC, but also in interactive 3270 BSC or in Model 25 RJE Multileaving BSC. Conversion to SNA and SDLC is not therefore the required entrance ticket to the use of the IBM 8100's very attractive distributed processing facilities.

Conversion to SNA would, however, make the use of the public packet switching digital data network very expensive for British, French and Benelux users, because the charges on these are distance independent but volume sensitive, with a fixed charge for each transmitted packet. If the user employs a hierarchical polling architecture like SNA on his packet switched links, he will be charged for every polling packet from the host and every NAK from the satellite 8100, instead of just for actual information packets.

This volume sensitive charging problem does not face the users of private leased line networks who need to keep these anyway for their voice communications. Such users may, however, want to keep the option open of using the IBM 3750 private automatic branch exchange (PABX) at their main and/or other office sites to concentrate and switch both voice and data communications traffic on common long distance lines. The IBM 8100 Information System can be interfaced to a 3750 PABX but only in BSC and not in SDLC mode.

Finally, US owned multinationals may wish to keep the option open of using the SBS satellite or some other satellite link for their US-Europe data communications when such satellite links become available. Such satellite links are subject to propagation delays of 0.5 to 1 second in each direction. This makes SDLC an unsuitable protocol on such links for any transmission speeds higher than 4800 bps full-duplex, because SDLC's three-bit packet sequence number field does not allow more than seven packets to be transmitted in one direction before an acknowledgement for the first packet is received on the reverse channel, which may take up to two seconds.

IBM users interested in the new pattern of distributed interactive processing made possible by the IBM 8100 Information System and public digital data networks should therefore steer clear of SNA for their long distance data communications links, and use SDLC only on their local 8100 controlled subnetworks.

Manufacturer	Model	Memory capacities (bytes): Main Min	Main Max	Disc Min	Disc Max	Type of disc	Maximum number of terminals	Local programming languages: Cobol	RPG II	Basic	Fortran	Other
IBM (SPD)	8100	256 K	512 K	23 M	320 M	Fixed	100 +	Y	—	—	Y	Asa
	3790	8 K	192 K	10 M	30 M	Fixed	40	—	—	—	—	Param
IBM (GSD)	System 38	512 K	1.5 M	64 M	640 M	Fixed	40	—	RPG III	—	—	—
	System 34	32 K	128 K	8 M	128 M	Fixed	8-64	Y	Y	—	Y	—
Digital Equipment	TRAX	192 K	3.8 M	56 M	1,408 M	Exch	100 +	Y	Y	Y	Y	Dibol
	DS 350	32 K	256 K	5 M	112 M	Exch	4	—	—	—	—	Dibol
Four Phase Philips	System IV P 7000	24 K	384 K	50 M	270 M	Exch	32	Y	—	—	—	Data IV
Raytheon-Coasor	PTS 1200	48 K	128 K	10 M	320 M	Exch	24	—	—	—	—	Macrol
ICL	System Ten 220	20 K	180 K	.6 M	180 M	Exch	20	—	Y	—	—	Package
Redifon	R 850	128 K	128 K	68 M	284 M	Exch	24	—	—	—	—	Package
Nixdorf	820/45	64 K	64 K	33 M	66 M	Exch	18	—	—	—	—	Package
Datasaab	D10/30	32K	128K	10M	120M	Exch	32	Y	—	—	—	Package
Intorex	S 7000	64 K	128 K	10 M	40 M	Exch	7	Y	Y	—	—	—
Incoterm	SPD 20/40	32 K	64 K	10 M	40 M	Exch	32	—	—	Y	—	—

Table 1. Distributed processing satellite systems with IBM 3270-compatible host file interrogation facilities

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As the year comes to a close "electronic mail" bids fair to become the buzzword of 1978 in the US computer-communications industry. MORRIS EDWARDS reports on the state of the art, and its likely development.

Battle is joined over electronic mail

ELECTRONIC mail is going to be a major battleground in the clash between AT&T and IBM, and possibly its affiliate, Satellite Business Systems. However, this time other major manufacturers such as Xerox, Burroughs and Exxon are likely to join the fray, along with that old warrior, the US Postal Service.

There's little doubt that electronic mail systems will mushroom in the years ahead, but what is less clear is what form the system should take, since there are currently cost and operational problems with each approach and a lack of compatibility between them. These approaches typically include facsimile, communicating word processors and computer-based message systems.

Facsimile is the foremost approach, primarily because of its similarity to mail. However, facsimile machines have traditionally been expensive to lease and use, and their usefulness stunted by lack of compatibility.

That situation is changing with the development of faster and less expensive units that meet internationally adopted standards, and with the availability of transmission services geared to facsimile users and capable of resolving equipment incompatibilities.

At the faster end of the scale, Rapicom is the leader in sub-minute machines (capable of sending a standard page in under one minute). Until the beginning of 1978, Rapicom had virtually no competition other than the 3M Co, which had announced a sub-minute machine, the Express 9600, but had not shipped a large number of units.

Since then other firms have entered the sub-minute market, most notably the Visual Sciences/Matsushita venture, Panafax, whose machines are presently the most powerful of any.

In terms of less-expensive models, the undisputed leader is Qwip, whose parent, Exxon, has financed three other successful electronic mail ventures: Qume, Vydec and Qyx.

There are rumours that another Exxon venture, Optical Information Systems, is developing a holographic storage capability which, if integrated with facsimile and word processing systems, could revolutionise electronic mail applications almost overnight.

On the question of compatibility, Study Group XIV of CCITT, the international standards body for communications, has announced preliminary standards for three facsimile machine types: ones that take from four to six minutes to transmit a page; ones that transmit at three minutes per page; and sub-minute machines. Besides resolving the compatibility problems, these standards also pave the way for "networking" which in turn will strongly promote electronic mail applications.

Rapicom provides this networking capability with its System 50, which permits a master station to poll up to 50 slave machines to retrieve or send messages from or to them.

However, the company which has made the biggest strides to date is the Burroughs subsidiary, Graphic Sciences Inc, which recently introduced two CCITT-compatible machines — one slow-speed and one sub-minute — and a network capability that links its low, medium and high-speed units for automatic operation.

Since users can put together an automated network of units operating at different speeds, they can better match their hardware to traffic flow — a facility which gives Graphic Sciences a decided edge for electronic mail applications.

Meanwhile, yesterday's facsimile leader, Xerox, continues to languish, though it is believed that major announcements will be coming soon on a sub-minute machine and one operating at 2-3 minutes per page.

While the word processors are starting to be used for electronic mail applications, for the most part they are still too expensive, and few currently have communications options (less than 10 per cent), partly because many applications are intra-facility and so require no communications, and partly because of organisational structures and attitudes.

Here again, though, the organisational barriers are coming down, and vendors are starting to upgrade the communications features on their latest models.

Compatibility requirements transcend communications protocols, since the machines must also transmit format information and other special codes.

With its magnetic card/Selectric typewriter combination, IBM initially settled on the 2741's Ascii-based protocol for transmission at 135 bps. Now, with its Office System 6 units, the standard is the 2770-compatible, Ebcdic-based bisync protocol, with operation at up to 2400 bps.

Intelligent word processors solve the compatibility problem by allowing the user to select the appropriate emulation mode via keyboard-entered commands or cassette- or diskette-loaded program. However, this facility comes at a price.

An alternative, and perhaps less expensive, approach is to use ordinary typewriters with Optical Character Readers (OCRs) to capture the text electronically.

Perhaps the most powerful electronic mail approach is the computer-based message system.

AT&T, Digital Equipment Corp and Hewlett-Packard all utilise computer-based message systems, while on the commercial front, Citibank has done the most pioneering work.

Of all electronic mail developments, perhaps the most encouraging signs of life come from the suppliers of transmission services. Already, Southern Pacific Communications offers a specialised service for facsimile users, while Tymnet provides a store-and-forward message service utilising its packet network.

Satellite Business Systems talks about high-speed document distribution as a major element of its planned service offering, and AT&T's proposed Advanced Communications Service is replete with features geared specifically for electronic mail applications.

Furthermore, ITT is waiting in the wings with a packet-switching service for electronic mail, and others such as Boeing and General Electric are poised for entry.

SPC's Speedfax service transmits a facsimile message to any of 30 cities around the country for a flat fee of 25 cents/minute, dropping to 16 cents/minute overnight.

Tymnet's store-and-forward message service, called OnTyme, allows communications between dissimilar terminals with speeds from 300 to 1,200 bps. Tymnet also supplies a turnkey system if required.

Some months ago, Tymnet's competitor, Telenet Corp, was making noises about an electronic mail service called TeleMail. In the meantime, the value-added carrier has apparently decided to concentrate its resources on higher-priority service, so TeleMail appears to be in limbo for the moment.

However, another timesharing firm, Scientific Timesharing Corp, is trying to follow in the footsteps of Tymnet, whose evolution as a value-added carrier stemmed from the network activities of its timesharing parent, Tymshare Inc.

Next year, ITT Domestic Transmission System plans to enter the packet-switching business with its Fax-Pak service, which will perform the necessary conversions in modulation, protocol, code and speed to allow incompatible facsimile machines to communicate with each other. Also, the network will allow users to send messages from a character-oriented terminal to any other subscriber's facsimile unit or terminal.

Another service planned for 1979, but liable to be delayed for at least two years, is AT&T's Advanced Communications Service (ACS).

Electronic mail also figures prominently in the planned Satellite Business Systems whose future was recently put in doubt by the action of the US District Court of Appeals in Washington, requiring the Federal Communications Commission to review its approval of the satellite carrier.

SBS proposes two configurations of a Batch Document Electronic Distribution System (BDS): BDS-1 would be a "communicating copier-like distribution system," while BDS-2 would be an "offline, local compressed document storage system with high-speed mailroom-to-mailroom transmission of batched data streams."

BDS-1 requires the sending and receiving devices to operate synchronously, whereas BDS-2 provides for store-and-forward operation using a magnetic tape unit for storing documents in digital data form. Each tape will be able to store up to 500 pages.

With these systems, mail would be collected the way it is today, and would be entered by mailroom personnel into the high-volume transmission system; the documents would be printed directly (BDS-1) or at some later time (BDS-2) in the recipients' mailrooms.

Recently, the electronic mail market has attracted another major entry, the US Postal Service. It is planning a system called ECOM (Electronic Computer Originated Mail) for delivering messages presently originated by large users on computers.

ECOM will accept input via data communications channels or computer tape and a central switching system will route the data to one of 25 other central called Serving Post Offices located nationwide. There, the messages will be printed, enveloped and delivered in the normal way.

ECOM's announcement raises several issues. Does it make the Postal Service a common carrier subject to regulation by the FCC? Isn't the Postal Service acting as a computer service bureau by printing all those bills instead of letting the user do it? Is ECOM the tip of a voluminous iceberg, with the Postal Service later expanding its electronic mail role to include the ...

By Morris Edwards

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Computer Sciences examined in govt scandal probe

Carr . . . disputed contract amounts for other years to be probed.

THE scandal-ridden US General Services Administration has added one more problem to its already long list. A recent GSA audit report states that the federal agency overpaid Computer Sciences Corp for computer services it provided the government during 1975.

The federal auditors have recommended that GSA determine the exact amount of the overpayment and take action to recover it from CSC.

The report also urges GSA to study the amount paid to CSC for computer services from 1973 to 1977. During that time, CSC had a sole-source contract with the government to provide services through its Infonet network.

The audit also examined allegations of impropriety in the acquisition of consulting services subcontracted out by CSC.

A total of $948,000 was paid CSC in 1975 for subcontracted services.

"In our opinion, serious questions exist as to the propriety of about $948,000 which appears to have been billed to the government for consultant and related services by CSC during 1975," the report stated.

"Further," it says, "it is our view that . . . the government incurred overcharges for consultant and analyst services acquired under the contract."

The report specifically questioned the propriety of $303,000 of the $948,000 that was paid to CSC directly for hourly consultants. In many cases, the report says, the consultants "did not meet the minimum requirements of the position level at which the consultant or analyst was being paid."

In one case, the reporter points out, a person billed as a senior consultant with 15 years' experience was being paid $45 per hour when he had in fact had only seven-and-a-half years' experience and should have been paid only $18 per hour.

Frank Carr, commissioner of GSA's Automated Data and Telecommunications Service said the agency would follow up on the specific charges for 1975 and, as soon as more manpower is available, would probe the disputed contract amounts for the other years.

He said that if overpayments were made, GSA would recover the money by withholding from CSC's current contracts.

William R. Hoover, president of the El Segundo, Califonia-based CSC, said his company "has always maintained high ethical standards in providing its professional services to clients, and will continue to do so."

He added, "We are confident these standards have not been compromised in our dealings with the GSA."

WASHINGTON REPORT BY CAMERON DAVIS

Adapso hits out at OECD data flow guidelines

OVER the border means out of control. That is the fear prompting and outbreak of national data protection laws restricting the flow of information across borders. But the US Association of Data Processing Service Organisation, Adapso, says the US does not sit back and accept the status quo as an "irreversible indication of the future."

In testimony before the US State Department's Public Advisory Subcommittee on International Data Flow, Adapso representatives blasted the revised transborder data flow guidelines proposed by the US delegation to the Organisation for Economic Co-operation and Development.

In their present form, Adapso complained, the TDF guidelines from the US meekly accepted "the inevitability of further unco-ordinated and disparate legislative efforts in Europe."

Philip C. Onstad, chairman of Adapso's International Data Communications Committee, told the State Department group that it was time the US got out of the back seat and into the driver's seat.

The US could assume a position of leadership, he said, by proposing the development of a uniform or model approach to TDF among the OECD's 29 member countries.

"In Europe today, a myriad of licensing, registration, notification and inspection requirements face the operator of a multinational data communication network," Onstad said. "The cost and difficulty of complying with an increasingly diverse array of national legislation may soon impair or eliminate the economic incentives to operate or establish these multinational nets. If this happened, the consuming public would suffer — through increased costs and lower quality goods, services, health care and education."

Onstad, a CDC executive, outlined the benefits that could accrue from a uniform approach to TDF legislation: uniform procedures would promote statutory compliance, without the deterrent of cumbersome, costly and conflicting statutory requirements, multinational networks would continue to expand; a uniform approach could still allow for local variations to suit the legal systems, mores and cultures of individual nations, and all individuals would share the same rights with respect to protected personal data.

"If successful," Onstad said, "this approach would encourage the enactment of legislation in each country which uniformly stipulates specific required and prohibited actions. This approach would satisfy the need to provide a fast, efficient and inexpensive mechanism for deterring violations of an individual's privacy and redressing specific grievances."

The OECD expects to combine the suggestions from the various countries and circulate a final draft of the proposed non-binding TDF guidelines next month. July 1979 is the target date for adoption.

Sources at the US State Department say, however, that implementation of the OECD proposals could take up to 10 years.

Changing lifestyles

CONGRESSMAN James H. Scheuer wants to know how the injection of the computer into America's educational mainstream will change lifestyles over the next few decades. To find out, the New York Democrat has introduced legislation in Congress that would establish a national commission to study the use of computers in education.

The new commission would have to carry out a number of in-depth research projects covering the next 20 years, such as a forecast of changes in information technology, with emphasis on the effect on education and lifestyles; a forecast of the need for individuals with computer skills; and a forecast of the effect of increased use of computers in education on school financing and local taxation.

It will also look at research in the application of cognitive psychology and artificial intelligence to computer-based learning.

'Stay loose till more is known of ACS'

"ACS is to the data terminal what Long Lines is to the phone — universality and ubiquity," says Harry Newton, president of the Telecom Group in New York.

Speaking at a seminar on AT&T's proposed Advanced Communications Service, sponsored by the Yankee Group in Cambridge, Massachusetts, Newton offered some advice to corporate users on how to make datacomm decisions.

According to Newton, the user should follow four pointers: "Stay Loose" until more is known about ACS' capabilities and pricing; make sure your network has an X25 interface; make sure your link protocol is HDLC (X25 based); and think twice about computers and terminals to which ACS will not interface.

Speaking at the same seminar, Dr Dixon Doll, president of the DMW Group in Ann Arbor, Michigan, said, "Everything ACS wants to do is like motherhood, and is generally needed by the end user." Still, he cautioned users to consider several "caveats" such as: Don't count on ACS tomorrow and do not think that ACS intrinsically provides all necessary services for true computer networking.

Converting existing synchronous nets to ACS is no trivial task, he pointed out, and asked how ACS will interface with IBM SNA networks.

Speaking at the ACS seminar for Westinghouse Electric Corp, Ralph Krichbaum said, "We want ACS to be successful, we expect ACS to be successful."

Krichbaum, manager of network planning in Westinghouse's Telecommunications Department, says one of the benefits of ACS is that it will set standards "so that we can say to vendors, 'If you can't communicate through ACS, you can't sell to Westinghouse'." He says his company is also banking on ACS to provide SNA "without the IBM shackles."

Krichbaum claims that many hardware vendors are "behind the eight-ball" with IBM's SNA and SDLC protocols.

"With Bell's system, those vendors would have a fixed target," Krichbaum says. Because AT&T is taking on the task of interfacing with IBM software, other vendors could develop new capabilities with the assurance that ACS would tackle the interfacing problems.

"Computer Weekly", "Data Processing" and "Systems International" present

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COMPUTER WEEKLY INTERNATIONAL

Use of laser in communications grows

THE use of lasers in fibre optic communications systems should grow at 50 per cent a year from 1980 to 1985, from $12.5 million to $56 million, according to a report from Business Communications Co in the US. Another report* from BCC predicts that the fibre optic systems market will grow from $28 million in 1978 to $1.2 billion in 1987.

The laser market is broken down into eight sectors, of which communications is the smallest and fibre optic laser communications only a part of that, along with atmospheric laser communications. They will have a combined growth of 35% between 1980 and 1985, followed by the information processing market, which includes point-of-sale scanners, printing and computer applications, and is predicted to grow at 30% in the same period.

The laser market as a whole is completely dominated by the military sector, which at $410 million in 1980 is over 30 times the size of the communications sector. It will continue to be the largest sector, but is expected to grow at about half the rate, which is still healthy enough at 18 per cent.

The markets for fibre optic equipment outlined in the second report are telecommunications, cable television, computers, process control and instrumentation, particularly medical. The equipment breaks down into cable, transmitters, receivers and connectors, and the report predicts mergers of companies making the different parts as the market demands complete systems.

The Expanding Laser Industry, report GB-050, price $750; Fibre Optics: Trends, Dynamics, report G-004, price $650, from Business Communications Co, Inc. (CW), PO Box 2070C, 9 Viaduct Road, Stamford, Connecticut 06906, USA.

INTERNATIONAL NEWS IN BRIEF

Itel widens horizons

EMPHASISING the growing business potential of the Third World, Itel Corp has sold its first IBM-plug-compatible mainframe in Iran and is setting up a joint venture in Mexico. The machine for Iran, an AS/5 machine approximately equivalent to a 3031, is to be installed with the Peralan Health Ministry. In Mexico, Itel has found a group of local investors to put up 51% of the capital for a new marketing company there. In Sweden, the first AS/6 system has been installed by the country's biggest department store group, NK-Ahlena.

Univac for Lot

THE Polish airline, Lot, is the second East European airline to order a Univac computer for reservations. It will use the Univac Standard Airline System software. The other airline, Aeroflot, bought Air France's Alpha software. The $3.95 million system is scheduled for installation in July, 1980.

Great Dane?

A WATCH DOG body for data processing has been set up in Denmark by a group of private citizens. Called the Danish Data Council, its stated aims are "to work for a democratisation of EDP, against the increasing registration of personal data, and against abuse of EDP".

Singapore order

A $55,000 order for Pertec D3000 disc drives has been received from Total Computer Systems in Singapore.

Fibre optic links for cable TV

A SWITCHED cable television system designed in the UK by Rediffusion and operated in Arnhem, Holland, by Delta Kabel is claimed to be the first in the world to use fibre optic links to carry a signal into a subscriber's home.

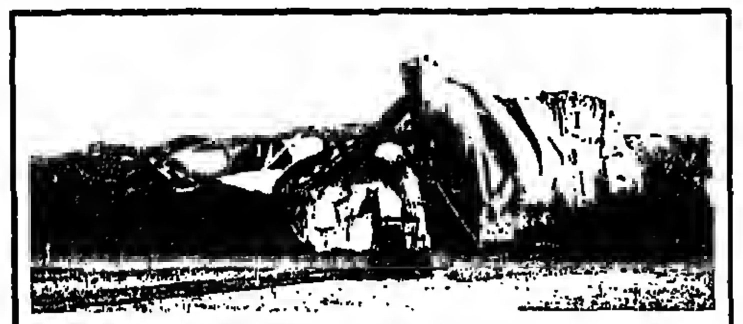
The system, called Dial-A-Program, at present offers television and stereo radio programmes, and Delta Kabel hopes to demonstrate a new service direct from Reuters in December or January if permission can be obtained from the Dutch PTT. The medium is also suitable for acting as a common carrier for high speed interactive information services, but Rediffusion says that providers of such services cannot charge for them unless the European governments allow pay TV, as the US and Canadian governments do.

At present the Dial-A-Program service operated by Delta Kabel under licence from Rediffusion has only one trunk link, one demonstration display and one subscriber link of optical fibre in addition to 200 coaxial cable links from one switching centre and 200 twisted pair links from another, but they came into service in the first week in June, beating a similar Japanese system, called Higashi Ikoma Optical Visual Information System, by five weeks. The Canadian system announced recently (CW, August 24) is planned to come into operation early next year.

The subscriber to the Dial-A-Program service uses a 12-key pad like a telephone push-button dialler to select the channel to be switched down his line from the exchange. Low speed signals from the keypad travel down the copper-clad steel reinforcing members in the fibre optic cable, and could be used with a simple interactive information system such as basic viewdata. More complex interaction could be catered for by providing a full alphanumeric keyboard if a suitable service was offered.

Dial-A-Program is a wideband switched service with a capacity of 12 television channels of which five are currently filled. Capacity can be expanded 12 channels at a time: a copper cable based system for South African Broadcasting Company built in Johannesburg in 1972 has 72 channels connected to 500 outlets.

The carrying capacity of the optical fibres used is similar to the copper links in the rest of the system, and no advantage is gained from using them at the moment. But the companies want to gain experience in the use of fibre optic technology in this type of system in preparation for the mid-1080s when copper prices are expected to pass fibre prices and keep rising.



Phoenix at Ford

THE shambles in our picture represents the aftermath of a huge fire, which destroyed car manufacturer Ford Europe's parts warehouse at Cologne-Merkenich, West Germany. The fire also caused extensive damage to the company's IBM 370/145 computer system.

Needless to say, however, this did not stop the DP department being inundated with requests for action. The accounting and insurance departments wanted information to help with the insurance claim. The supply and distribution departments had to produce plans for a substitute warehouse, as well as to plan the ordering, acceptance, stocking and distribution of parts. Various other departments added to the load by asking for report summaries.

Under these trying circumstances, the Informatics Mark IV software system purchased by the Parts Operation the previous month proved a great asset; indeed, the company estimates that the investment paid for itself in just three weeks.

The gain came from the time saved in developing and running the new programs required. The DP department managed to do this in just half a week, a third of the time it would have taken using Cobol. Furthermore, they did it on a different machine, a 370/168, using a different operating system, OS instead of DOS. They were able to make this change without altering the Mark IV software at all, it being necessary only to convert the JCL.

Network aids research

RESEARCH into magnetohydrodynamic electricity generation at Montano Energy Research and Development Institute in the US will be aided by a five-computer distributed network to be supplied by General Automation at a cost of over $1 million.

The system will process over 2,000 analogue and digital input and output links to components of the magneto-hydrodynamic equipment which generates electricity from fuel oil or coal in a way that may offer a 50% increase in efficiency over conventional steam and nuclear systems, and reduce pollution and water consumption as well.

The network will consist of five 128K byte GA-18/440 minicomputers with floating point arithmetic units. Four of them will run tests and communicate the results over high speed HDLC links to the fifth, which will have six interactive graphics terminals attached, as well as a printer, a plotter, a card reader, two 80M byte drives and two high density magnetic tape units.

Hardware for Hardwar

THE first three Univac 1100 orders in India, exclusively revealed earlier this year (CW, April 27) have now been formally announced. As reported, Air India, currently a user of the British Airways IBM reservation service, is to get an 1100/12 and will run the Univac USAS airline reservation package.

The other customer is Bharat Heavy Electrical Ltd, BHEL, which last month took delivery of an 1100/11 in Hardwar, Uttar Pradesh state, and will install a second in Delhi next month. Worth over $4.6 million all told, the orders were taken by Operations Research Group of Baroda, Univac's Indian agent.

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ICL France boosts turnover

TURNOVER for ICL France the year ending September ... estimated to have been ... 355 million francs, £41 m... compared with 323 mi... francs last year. ICL Fr... currently employs 960 people.

The worldwide figures for ... will not be announced until ... end of the year, but are expected to be just over £500 million ... the French weekly 01 Informatique, managing director ... Wilson revealed that during ... year, ICL shipped 120 2960s, ... 35 2950s.

He also revealed that ... company is currently manufacturing four 2950s and ... a week, and one 2980 ... and one 2972, every ...

On the European ... industry, he was ... "Let me be arrogant ..." "We are the most ... European computer ... not the only one, and ... to remain so."

Stories written on to VDUs

OVERSEAS correspondents ... the UPI wire service will be ... to write their stories on to VDUs and send them in complete ... editing on screen, instead ... typing and passing them to ... punch tape operator for transmission.

An £80,000 order placed ... ATS Communications, of Haywards Heath, covers 30 ... telegraph compatible ... receive and edit visual display terminals to be installed ... Europe, the Middle East ... South Africa over the next ... months.

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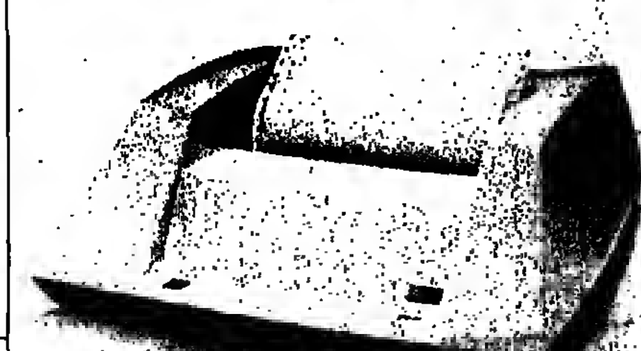

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INMS requests the pleasure of the company of Cobol Programmers and Systems Analysts to discuss these outstanding opportunities at an
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No appointment is necessary.

If you cannot accept this invitation please telephone to make an alternative appointment.

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Recruitment Consulting Division
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Please apply for an application form to:
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Telephone: 0282 815888.

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These vacancies have occurred through internal promotions to more senior levels indicating that career prospects are definitely good for able candidates.
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For further information on any of the above vacancies please contact the appropriate consultant.
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Ref. RW 45/3

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NCR	B1, B2	OPERATOR	1½ YRS	£4000
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A major financial organisation based in the city wishes to recruit a number of capable programmers to join their rapidly expanding DP department. The company is interested in programmers with a minimum of one years experience preferably on ICL equipment.

The hardware in use is the ICL 1900 range running under GEORGE II but plans are well advanced for an upgrade to the 2900 series so any experience gained on 2900 models would be advantageous.

A competitive salary is coupled with an attractive benefits package which includes LV's, 4 weeks vacation and a subsidised mortgage.

Reference JC 45/3

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London (All Areas) **£4000 to £6500+**

We have a varied selection of vacancies in all areas of London covering a wide range of programming experience.

These positions cover a broad spectrum of the Computer Industry, ranging from large well established software consultancies and manufacturing companies to small retailing and publishing concerns.

The equipment in use includes all the IBM SYSTEM 3 series and ICL 1900 and 2900 mainframes.

All the companies offer attractive starting salaries, and fringe benefits vary from Free Lunches and Season Ticket Loans to Travelling Expenses and Annual Bonuses.

Reference JC 45/4

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UNIVERSITY OF STRATHCLYDE

Applications are invited for TWO posts of

COMPUTER PROGRAMMER

in the MANAGEMENT SYSTEMS DIVISION of the UNIVERSITY ADMINISTRATION.

The posts will involve programming in COBOL for both new systems and the maintenance of existing systems. The University Administration operates a Honeywell 6060, 256K tape/disc system which provides both batch and interactive processing services throughout the University. The appointments will be particularly suited to candidates with 2–3 years' programming experience and preferably with graduate or other qualifications in Computer Science.

Salary scale on Grade LA of the national salary structure for senior Administrative Staff. Salary scale £3384–6586 with placing according to qualifications and experience. Superannuation benefit.

Application forms and further particulars (quoting 88/78) and enclosing a [illegible] may be obtained from the Academic Appointments Officer, University of Strathclyde, Royal College Building, 204 George Street, Glasgow G1 1XW, with whom applications should be lodged by 21st November, 1978.

CLASSIFIEDS

CICS Analyst Programmer. OS or DOS with either COBOL or Assembler experience. Central London based, salary dependent on experience to £7,250. Financial systems background preferred but not essential.

CORAL 66 Systems Designer for 6-9 months Poole based contract. Rate from £285 p.w. PDP 11 background an advantage. Software or technical preferred.

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RW 45/7

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Portsmouth Polytechnic
Computing Centre

Applications Programmer — Post 777

We have recently installed an ICL 2960 and an ICL 2094 to provide a computing service to the whole Polytechnic. Applications programming projects cover not only scientific and technical work but also the design and implementation of computer systems for the administration and library. The Computing Centre seeks to recruit a programmer of graduate or equivalent qualifications, and some previous experience, who wishes to increase his/her experience by working on modern computers. There is a wide range of projects now being started including graphics software, implementation of the IDMS database, and software to support minicomputers linked to the 2960.

Salary Scale. AP2/4 up to a maximum of £4,632 including supplement

Senior Computer Operator — Post 774

The Polytechnic service is based on a large ICL 2960 supplemented by ICL 2904 and a professional operator is required to join a small operations group currently working on two shifts. Candidates must have a good understanding of VME/B or an equivalent operating system, and at least three years' operating experience together with an 'A' level standard of education.

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Applications are available from the Staff Office, Portsmouth Polytechnic, Alexandra House, Museum Road, Portsmouth, or by telephoning Portsmouth 27881 extension 317.

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£4,660-£7,146

The North of Scotland Hydro-Electric Board will install in their Computer Centre in Aberdeen Dual I.C.L. 2960 computers in mid-1979 to replace their well established System 4 equipment.

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Experienced Systems Programmers are required to develop this software and those with a knowledge of VMEB, MAC, TP or IDMS would be particularly welcome.

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If you want job satisfaction in a stimulating environment phone Ken Hutcheon at 0224 692671 for further information or send details of your qualifications and career to:

**Computer Services Manager
North of Scotland Hydro-Electric Board
Computing and Accounting Centre
20D Ashgrove Road West
Aberdeen AB9 2NY**

City of Manchester
Treasurer's Department

Senior Programmer/Analyst

£5,232-£6,060 inc. supplement

With several years experience of programming in COBOL and/or systems analysis, to assist in designing, developing and supporting application systems (some of which are on-line), working as a senior member of a team.

Analysts/Programmers

£4,245-£5,073 inc. supplement

With minimum of two years experience of programming in COBOL and/or systems analysis, to work in a team developing and supporting application systems.

Junior/Trainee Programmers

£2,823-£5,073 inc. supplement

Preferably graduates or holders of an HNC in computer studies or mathematics, though candidates with good A-level mathematics or qualifications in other subjects will be considered, to assist in flowcharting, writing and testing programmes. A knowledge of COBOL would be an advantage, but training will be given.

Starting salary for trainees will be within advertised salary range dependent upon age, experience and qualifications.

A large ICL System 4/72 computer is currently in use. An interesting variety of work, both financial and non-financial, is done for all departments of the City. There are good career prospects.

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The City Council operates a Union Membership Agreement under which a new employee is required to become a member of a recognised Union.

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Our client offers this very real opportunity now if you are prepared to analyse and structure the knowledge and experience you have gained to date, and gear it to motivating technical and user staff from either line or supportive supervisory or managerial positions. In order to succeed in this role you will be given comprehensive training. Ideally you should be able to communicate easily with all levels of management and staff, be outward looking and thinking in your approach to your future career in a rapidly changing DP world. You should possess four to five years COBOL programming experience BUT applicants with less experience will be seriously considered at the appropriate level.

TO APPLY

Please send, immediately, a ONE PAGE, handwritten or typed brief list of: name, address, age, home and office telephone numbers, present position and salary, type of DP activity you are involved in, related hardware and software exposure, previous posts, to ANTHONY SPURR, Management Recruitment Division, quoting reference number G675, at the address below. Please list on the back of your application those companies you do not wish your application to be short listed. Applications are invited from either sex. All applications will be dealt with promptly in writing after confidential telephone call.

BIS Applied Systems Limited
York House, 199 Westminster Bridge Road
London SE1 7UT
Telephone 01-633 0866

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A large retailing organisation is upgrading its installation to a 2960 and requires COBOL Programmers to help its teams in a complete rewrite of all systems — FILE-TAB, PLAN and various software packages. This is a 3-4 year project — opportunities for advancement are significant. The working environment is ... and a staff discount is offered on all merchandise.

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The Council, at present, operates a 370/138 with a growing terminal network and substantial enhancements are scheduled. Development of a comprehensive interactive information system is being undertaken and this post will play a major part by providing the most appropriate and cost effective software environment.

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HYNDBURN BOROUGH COUNCIL

Programmer/ Analyst

AP4/5 £4245-£5078 (including supplement)

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Application forms are available from the Personnel Officer, Town Clerk's Department, Hyndburn Borough Council, Municipal Offices, St James Street, Accrington, and should be returned by 27th November, 1978.

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IBM OS

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Quote Ref. JC 7200.

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MATRIX
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360 Oxford St. London W1N 9HA.

UNIVERSITY OF STRATHCLYDE
Applications are invited for a

COMPUTING OFFICER

in the COMPUTING CENTRE. Applicants will normally hold an Honours Degree or equivalent qualifications. The successful candidate will work in the applications group, concerned with packages, standard programs and utilities and will take part in other Computer Centre activities. The University of Strathclyde, Edinburgh and Glasgow are linked by 50 Kb communications lines with node processors at each site. Systems accessible through the network include local systems (ICL 1904S, Honeywell H6060, CTL front-end-processor), ICL 2980 and 2976 systems at Edinburgh and Glasgow respectively and IBM systems at Newcastle.

Salary on other related staff scale Grade IA £3883-£6555 (under review). Placing according to qualifications and experience. Superannuation benefit.

Application forms and further particulars (quoting 62/78) and enclosing a self-addressed envelope (9" x 4"), may be obtained from the Academic Appointments Officer, University of Strathclyde, Royal College Building, 204 George Street, Glasgow, G1 1XW, with whom applications should be lodged by 29th November, 1978.

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£150 to £400 p.w.
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Lecturer in Applied Computer Science

University of Fort Hare
Republic of South Africa

Applications are invited from suitably qualified candidates for the above post.

Minimum requirements University degree with D.P. experience.

The medium of instruction is English.

Assumption of duties: As soon as possible.

Closing date for applications 11th December, 1978.

GENERAL

A new department at Fort Hare has recently introduced courses which are intended to meet the career requirements of Black graduates in respect of Information Processing and Computing. The incumbent of this post will assist in planning and presenting graduate courses for students who are being trained or are obtaining pre-training for such professions as. Accounting; Information Processing; Engineering; Land Surveying; Statistics; Applied Mathematics; etc.

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In addition the following are paid:

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Additional fringe benefits include group life assurance, medical aid (subject to certain conditions) and pension scheme. Generous leave privileges and financial assistance towards the University education of children.

Applications including a complete curriculum vitae and the names and addresses of at least THREE references, should be addressed to:

The Staff Officer, University of Fort Hare
Private Bag 314, ALICE 5700
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Checkpoint is a computer consulting and contract programming company. Salaries from $16,000 to $23,000. Living and relocation costs will be negotiated. Assignments range from six months to two years, starting in February.

To arrange your London interview, please call or send resume to:

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Sterling Cable Company Limited, part of an international group, are one of Europe's foremost designers and manufacturers of industrial electrical cables. Our works and offices are located in rural surroundings on the A4, nine miles from Reading and Newbury.
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For an application form, please telephone our Personnel Manager, Mr. J. W. Heading, on Woolhampton 3221, or write to him at Sterling Cable Company Limited, Bath Road, Aldermaston, Reading RG7 5QQ.

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Computing Services Association

Programmers

This Sunday you have a choice- The Big Match, yet another old film

Sunday afternoons can be very dreary, and indeed wasteful. You know how it is. You finish your Sunday lunch and fall into a chair. Well this Sunday, November 12th, instead of watching the Big Match or a repeat of an old film, make a positive career move. Ring IDEC.

The reason why we're planning our phones on a Sunday is because we genuinely believe that the offer we are making to talented Real Time and DP PL/1 Programmers, at every level of experience, is second to none. The exposure we give you at the sharp end of 'State of the Art' Software Development will be invaluable to your career, the rewards are high and job satisfaction considerable.

IDEC is the design and development centre of ITT Business Systems and Communications Group, based on the London/Herts border and Sidcup in Kent. We are responsible for the major software development activities of the new products marketed by this worldwide organisation.

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So instead of settling down to watch the telly, put your Sunday afternoon to good use by ringing us on Potters Bar 51199 between 9.30am and 5.00pm. Or call us any weekday and ask for Sue Cameron. IDEC, Canada Life House, High Street, Potters Bar, Herts.

or a 'phone call to IDEC.

IDEC A Development Centre of ITT Business Systems ITT

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IBM 370/138—JUNIOR & SENIOR OPS £4100-£4700 Inc

One years experience for the Junior position, 18 months for the Senior W London based, involved in the leisure industry, running under DOS/VS CICS Three shift system Good prospects, excellent perks Ref 581

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CDC 174 6500—SENIOR OPS £4700 neg

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Outstanding opportunities exist for Recruitment Consultants with a DP background. It's a fast moving business offering limitless potential to the right people

PROGRAMMERS ETC.

OPS MANAGER £7700 Inc

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DATA SECURITY OFFICER £8000

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PROGRAMMER £7000 neg

Two/three years' experience using COBOL, with a thorough knowledge of CICS is required by this Herts installation Hardware used is an IBM 370/115, under DOS/POWER. Outstanding career prospects, excellent perks. Ref. 463.

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We've started a comprehensive expansion programme in hardware, systems, staff and accommodation — why not expand with us?

If you're interested — phone or write (with details about yourself) to — Peter Brown, Computer Services Division, County Hall, Kingston upon Thames. Tel: 01-546 1080 ext. 3479.

SURREY COUNTY COUNCIL COMPUTER SERVICES

WORCS - GLOS - WILTS - DORSET AVON - SOMERSET - DEVON

To £8k +

A wide range of vacancies exists from Programmer to Systems Designer in the above counties (25+ alone in Glos.). The equipment in use is also varied. It includes ICL 1900 and 2900 series, IBM 370, DG NOVA, PDP-11, Honeywell and Veirian. The languages vary from COBOL to ASSEMBLER to PLAN to PL-1 to Basic. In short there just isn't enough room to tell you about them all. Should you already live or wish to relocate to this expanding part of the world, then urgently phone Bristol (0272) 426831.

Hertfordshire County Council

MID-HERTS/BOREHAM WOOD COLLEGE

Department of Computing, Science & Technology

LECTURER I

for Programming (COBOL and BASIC) and Business Data Processing

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Part-time applicants also welcomed.

Further information and application form from the Principal, Elstree Way, Boreham Wood, Herts.

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or Tel. 01-328 7251

UNIVERSITY OF WARWICK

2 RESEARCH STAFF

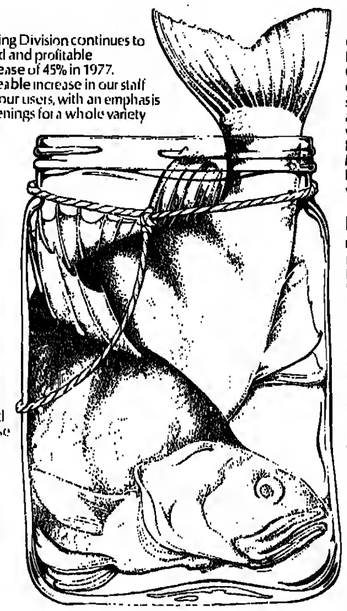
Distributed Computing Research Project

Further substantial support for the Project has been announced by the Science Research Council, for the design and construction of an integrated hardware/software system for distributed computing. Current work centres around an experimental programming language intended to be usable on systems with different architectures. Two research staff are required, one or possibly both at postdoctoral level, to work on the language design, software and hardware aspects of the project. The posts are for four years, from October, 1978, awarded under the SRC Special Grants Procedure. Appointments will be either on the lower part of the Range 1A scale: £3,883-£8,556 p.a. or the Range 1B scale: £3,384-£4,662 p.a.

Application forms from the Academic Registrar, University of Warwick, Coventry, CV4 7AL, quoting Ref. No. 147/A/78. Further details may be obtained from Dr. C. Whitby-Strevens (phone Coventry 24011, extn. 2383) or Mr. O. May (extn. 2387) in the Department of Computer Science.

At last a bigger pond!

For computer professionals in technical support



Our newly-structured UK Marketing Division continues to contribute to the ICL Group's rapid and profitable growth, following a turnover increase of 45% in 1977.

So we now need to make a sizeable increase in our staff supporting the wide spectrum of our users, with an emphasis on the public sector. We have openings for a whole variety of technical skills, and a thorough product training will be given as required.

Bigger Company

ICL is already Europe's leading computer manufacturer. Its technological innovations have gained worldwide recognition, particularly the 2900 Series and more recently the Distributed Array Processor. The Group's market base covers 86 countries around the globe.

Brighter Opportunities

If you are one of the dedicated professionals we seek, you will work closely with our existing and prospective customers to optimise the application of our computer systems. Vacancies exist in:

Project Management
£6,000-£10,000
Experienced managers, male or female, with proven ability, who will take responsibility for seeing through significant projects.

2900 Implementation
£4,000-£8,000
Technical specialists who can ensure the smooth implementation of sophisticated hardware and software.

General Support
£4,000-£7,500
Technicians involved in pre- and post-sales activities to ensure customer satisfaction across a wide range of ICL products.

Consultancy
£5,000-£9,000
Specialists in software or applications systems (eg TP, database) who can provide particular expertise to all levels of customer management and technical staff.

Our appointments range from North-East Scotland to the South Coast, both at ICL offices and on customer installations. We have substantial requirements in and around the following locations, where interviews will be arranged:
London Birmingham
Manchester Edinburgh
Relocation assistance is available where appropriate.

Broader Variety

Our equipment spans the entire range of customers' requirements from the small 1500 Series through System Ten, 2903-4, System-4 and the 1900 range to the largest 2900 machines and DAP.

You will be working in an exciting, constantly developing environment with the intellectual stimulation of being alongside some of the best people in the industry. We are particularly looking for specialists in:
Operating Systems
Telecommunications
Languages and Compilers
Data Management
Transition
Operations

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If you have the right technical ability plus an outward-going personality, this is more important than proven skills on our equipment. We have a number of training centres, with an excellent reputation for both technical and management training. The largest, at Windsor, has a training staff of 150.

If your present environment is restricted and you are looking for something bigger and better with more variety and prospects, all this adds up to a first-class opportunity to move to that 'bigger pond'. Alongside this, there are also a limited number of both sales and secretarial openings in our UK Marketing Division.

Our new brochure 'Your Future with ICL in Technical Support' gives more details of the opportunities.

Either telephone our special Recruitment Centre based at Bailey's Hotel (opposite Gloucester Road underground station) on 01-373 8131 and ask for Elizabeth Hobbes or one of her colleagues (any time between 9.00 am and 8.00 pm).

Alternatively write with full details of your experience, quoting reference CW1032, to: ICL (UKD) Recruitment Centre, c/o Bailey's Hotel, 140 Gloucester Road, London SW7.

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ICL

PL/1

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International company requires PL/1 programmers for the following U.K. locations: Central London, Herts, Hants, Bucks & Cheshire. Applications are commercial and the hardware is IBM 370/145 & 158 under O.S. but DOS/VS programmers will also be considered if they are prepared to switch to O.S. The client wishes to recruit project leaders, analyst programmers, senior & junior programmers, 2-7 years' PL/1 is required within a commercial environment. Some positions could involve U.K. travel. Salaries will be above average and dependant on experience.

Project Leaders £6,500-8,750 p.a.
Analyst Programmers £6-7.5K p.a.
Senior Programmers £6,000-7,000 p.a.
Programmers £5-6,250 p.a.

Database and on-line applications experience would be considered very advantageous but in any event training will be given to sound Batch oriented programmers. The company operates a flexitime system and will pay relocation expenses where applicable.

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They have developed, and operate a wide range of software packages which are compatible with both the operations and scale of their clients, which range from small businesses to international conglomerates covering just about every area of industry and commerce.

They can therefore offer programmers a very unusual opportunity to work on a very wide range of projects and systems and gain a breadth of experience that is unlikely to be offered by industry.

You will need a good understanding of commercial business systems, including the principles of double entry book-keeping, around two years' experience of working on large mainframe machines using COBOL ASSEMBLER or PL-1 and good experience of systems documentation.

Training will be given in auditing principles and the use of computer audit techniques, which will enable you to take early responsibility for providing technical support to their accountants and developing and testing new audit interrogation programs.

Salary will be negotiable around £5,000.

Please write to Malcolm Kennedy, Royds Recruitment, Royds House, 5-7 Mandeville Place, London W1

ROYDS

Royds Recruitment Ltd., Royds House, Mandeville Place, London W1M 6AE.

Join the Computastars

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We are looking for experienced land fitl programmers to join our computer programming department at the York head office of the Rowntree Mackintosh group. This is a busy department of about 6 programmers who, working together in small teams, develop and support programs which cover most aspects of our business.

Our computer installation is one of the largest in the north of England. We have an IBM 370/158 running under VS1 and an IBM 370/148 running under VM/370 and use CMS for the interactive development of programs. In 1979 the 370/148 will be replaced by a 3032 operating under MVS and TSO will replace VM/CMS for program development. Many of our applications use data base and teleprocessing techniques with TOTAL DBMS and TASK/MASTER.

A training course will be designed to suit your particular needs and will include training in the use of data base, teleprocessing and interactive program development techniques.

Applicants should have been educated to 'A' level standard or higher and have at least a year's programming experience in a high level language, preferably PL/1, although COBOL, APL etc would be considered. Knowledge of data base and teleprocessing techniques would be an advantage.

If you are interested and have the background specified, please write (quoting ref. FY. 603) to Miss O. M. N. Dick, Staff Office, Rowntree Mackintosh Ltd., York YO1 1XY.

Rowntree Mackintosh

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up to £6,366

The duties of this post are to supply technical support to the production team, and also the VME/B operating system to be used on the Council's ICL 2960. The job will primarily be to assist the Chief Technical Support Officer in the creation and maintenance of a satisfactory operating environment. At least 1 year's support experience is required.

Application form from Personnel and Management Services Officer, London Borough of Greenwich, Peggy Middleton House, 50 Woolwich New Road, London SE18 6HQ. Tel 01-854 8888 Ext 2119.

Closing date 24th November, 1978.

The Council is an equal opportunities employer. All applicants will be considered, irrespective of sex or country of origin.

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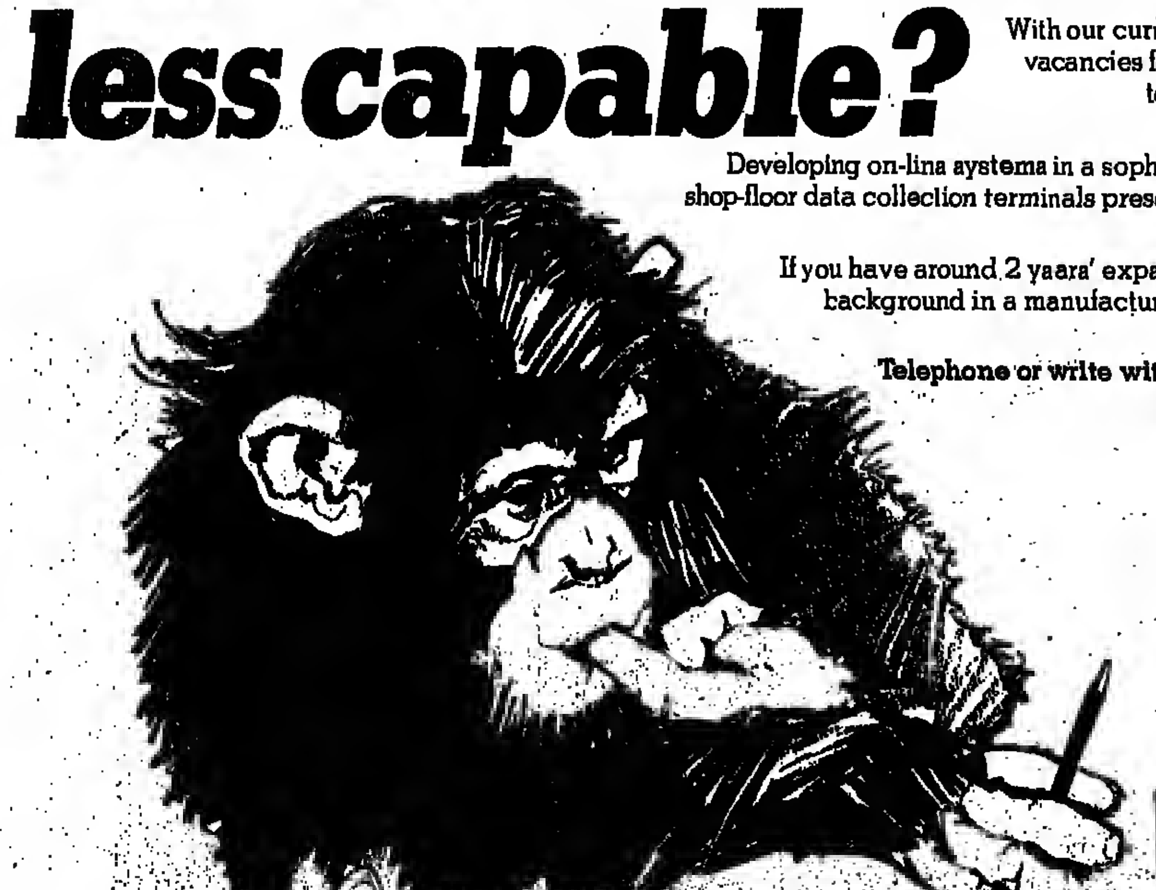
Developing on-line systems in a sophisticated production control environment using VDU's and shop-floor data collection terminals presents challenging opportunities for the right professionals to channel their talents into a fast developing project.

If you have around 2 years' experience and are either an Analyst with a production control background in a manufacturing industry, or an experienced Programmer with COBOL fluency, we'd like to meet you.

Telephone or write with brief career details, to Ron Rumbol, Petters Limited, Staines, Middlesex. Tel: Staines (81) 51333.



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We have a great many opportunities that reflect the large number of real-time projects Software Sciences is working on. Projects in defence, ATC, and process control — often complex, always challenging, and all very important. This is the sort of work which is the test-bed for advanced software and systems. It's where the standards are highest; where hardware technology, systems design, and programming make the most exacting demands on individual skills; and where innovation becomes a reality.

We have vacancies at a number of levels, from programmers with a minimum of three years experience to systems designers with, say, eight years plus in computing. The one thing which all candidates should have is the desire to succeed. Software Sciences will give you your opportunity — regardless of how you measure success.

You may be motivated by ambition, achievement, reputation, money, or responsibility. You will be able to choose the career path you want — whether it takes you into management or in pursuit of technical excellence. Wherever you feel you fit, as a vital member of Software Sciences you will be part of a successful expanding group of companies which gives you both security and opportunity.

Our vacancies are based in Farnborough, Macclesfield, and London, and may involve project work on-site. Salaries will depend on experience but they, and the benefits offered, are unlikely to fall short of expectations.

The coupon indicates the type of experience we are looking for. If you are interested please complete it and return to Sarah Chambers at Farnborough. You may, if you prefer, contact her by telephone or letter for further information or for an application form.

Why Software Sciences

[illegible] in such areas as newspaper applications and computer aided design; it has built up an extensive design and build capability in microprocessors; it pursues a successful software product policy; and it was the first software house to establish a distinct R & D Facility. The Group now has offices in Farnborough, London, and Macclesfield, subsidiaries in Warminster, Bedford, and Rugby, and an international operation with bases in Holland, Germany, Belgium, Sweden, and the US.

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Their problems include development of hardware, operating systems, languages, APPLICATION PACKAGES, marketing of existing products and new products based upon microprocessor technology.

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Your present company provides you with a good salary, a car and a package of benefits — *but does it really distribute all of the profit entirely to employees?*

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Ring and ask for Ian McEwan who will provide you with information, assess your experience and immediately arrange an interview.

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Siemens, whose word processing system is amongst the European market leaders, has recently introduced the 'Word Bank' into the UK and is looking for new members to join an enthusiastic team.

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If you're the person we want, you may be feeling you're in a technical 'cul de sac' and that your specialisation in computer industry technology is holding you back from meeting people.

We'll want you to be involved in client contact. Of course, you must have proven technical know-how and experience but, just as important, you need to understand the business problems and potential of customer-clients. You'll be dealing with senior management and discussing benefits and applications of our 'Word Bank' system. There's an attractive salary, in line with experience.

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For both positions there's full training and the benefits of working for a company employing over a quarter-million people world-wide.

If you think you've got what we went and we may have what you are looking for, contact Tony Weeks, Personnel Menager, Siemens Limited, Siemens House, Windmill Road, Sunbury-on-Thames, Middlesex. Telephone Sunbury 85691.

These vecancies ere open to mele or female epplicante.

Programmers & Analysts

Middlesex/Hertfordshire £6,600 p.a.

A Data Processing Department is the backbone of any successful company, especially if the company is a Multi-Million Pound Manufacturing Organization with a turnover in excess of £1,000 million.
That is why we would like to hear from PROGRAMMERS and ANALYSTS who can become members of the team for the development of new Commercial applications.
The installation presently runs dual 1900's under G2+, but owing to the continual demand from users, one of the 1900s is shortly to be upgraded, probably by a 2960.
Programmers will need at least 18 months' experience of Cobol, knowledge of G2+ and Ostedrive would be an added advantage. Analysts will need a Programming background, with 18 months' Analysis experience, although Programmers who wish to advance their career into Analysis will also be considered.
The Company can offer an excellent career path through to Management, plus the usual benefits of a large company which includes Staff Shop, Sub canteen, Sports Club, Life Assurance and 4 weeks' holiday per year.

Ref CW 45/1

Opportunity in Sales

London, W1 £9,000 on quota

A unique opportunity has arisen for sales people to join a young and rapidly expanding Bureau and Systems House, who can offer ground floor opportunity to the successful candidates.

The Company, situated in W1, has a Prime 400 and sells both Application Software and Time. The applications are mainly financially orientated so you will be selling to Accountants and Financial Directors.

The successful candidates will be aged in their mid-20s, and have had 2 years' selling experience, preferably in a Commercial environment, but this is not essential as full-time training will be provided. It is envisaged that your career path will give you the opportunity to move into management with the growth of the Company.

Ref CW 45/2

GERMANY Programmers with 2 years +

An expanding German Software House currently require programmers with just 2 or more years' experience in programming on the following machines

DEC POP 11
Honeywell Level B
Siemens 330

They have opening for Applications Programmers and Systems Programmers.

If you have considered moving abroad and have now got sufficient skills in one of the above areas, then our client can offer you full-time employment on a variety of projects.

The ability to speak German or French would be useful but not essential. Salaries and company benefits are attractive in accordance with local market conditions.

Ref CW 45/3

Systems Analyst

Dublin £7,500

An International Company requires an experienced Systems Analyst for a new development. Good commercial systems experience in a DOS/VS environment would be ideal, but successful candidates must have completed at least one decent commercial system. A programming background in Cobol would also be a help.
A top class salary and conditions of employment will be offered to the right calibre of applicant. Career prospects are good and relocation expenses will be provided where necessary.
Write or telephone Gerald Delamare at Dublin 789577.

Ref CW 45/4

Hardware Systems Engineer

MIDDLESEX

The Electronics Division of a Multi-National company based in Middlesex need to increase their support team on their MINI Communications Hardware. The company uses distributors for day to day sales and support.

They require an experienced Hardware Engineer to join a small team in continually evaluating new Hardware products to add to the companies existing product range.

Candidates should have an academic qualification Electrical/Electronics Engineering, direct Hardware Support, write their own test programs, exposure to training and product launches.

This is an ideal opportunity for an experienced engineer to join a small dynamic team supporting communications Hardware and evaluating and testing new potential products at the forefront of the industry.

Ref CW 45/5

System Programming Consultants

for Distributive Projects

West London up to £9,000

A major international Software House has a need for the following specialised people -

- ★ Programmers with Assembler ICL 7502 16 Bit Communications Controller interfacing to a 2960.
- ★ Programmers with in-depth Singer 1501-1502 experience, which is linked to a IBM 370/148

They also have a need for experienced Programmers to work on large sophisticated 2900 projects using IDMS and TP.
The Company can offer an excellent salary package with the usual fringe benefits one would associate with a Company of this size

Ref CW 45/6

Software Engineer

IBM Experience

Middlesex/West London

The Data Communications Division of a $3 Billion Corporation operate a small and highly successful company employing about 80 people World Wide. The bulk of the day-to-day sales and support is handled by about 37 distributor companies in over 40 countries.
One of the main functions at this nerve centre is the on-going new product evaluation. The continual process of introducing new product lines to the existing Hardware and Software range stimulates work content and job satisfaction for the people involved.
Plans for 1979 involve the introduction of many new products which will have to be evaluated, tested and supported through distributors. An important new product range incorporates a direct channel interface into IBM mainframes. Accordingly for this appointment, we need candidates with experience of IBM or IBM compatible equipment. Specifically, we need people with experience of IBM software including access methods, TP Software and interfacing with mainframe environments.
This appointment calls for a highly qualified individual who has the strength and ability to evaluate market trends, organise training facilities and to take responsibility for his/her own specialised area. Long term opportunities exist for movement and growth within this right knit organisation.

Ref CW 45/7

European Systems Support

West London based

to £7,500 + car + benefits

Although a relative newcomer to the European Market, our clients, a remarkably successful company in the Data Communications sector of the industry, require a Senior Systems Consultant to join their European Support Centre.

Working in a small but highly powered support group, the successful candidate will report directly to their European Systems Manager.

Essentially this position is of a consultancy advisory role, providing pre and post sales support to customers in the UK and throughout Europe. When given the necessary training, the ability to handle and find solutions to customers' problems is essential.

Candidates should have worked in a marketing environment already, in an inter-active communications field. Experience of IBM 327Os or compatible equipment would be ideal.

In summary, this is a position for a highly talented individual, who has the initiative and appropriate skills to make an important contribution to the company's success. Rewards include a competitive salary, car, generous relocation expenses in addition to travelling expenses to Europe and the United States.

Ref CW 45/8

Senior Analyst for New Installation

London up to £8,000

370/138

One of the few opportunities today has arisen for a qualified Senior Systems Analyst to join a New Installation, an IBM 370/138 which has just been delivered.

The nucleus of this department is currently being recruited and will be expanded next year. The successful analyst will report directly to the Data Processing Manager and will be responsible for their own project including the programming function.

Candidates should have at least 6 years' O.P. experience and have worked on 2 projects, through to implementation. Experience of IBM Hardware would be helpful and Financial Business Systems would be ideal. The company have an existing Mini Based Communications Network and the support of these systems will provide interesting development projects in future.

Ref CW 45/9

CCC

Central Computing Consultants

KINGSTON: 44 Wood Street, Kingston upon Thames, Surrey, England. Telephone 01 549 3212 Telex 27950
DUBLIN: Canberra House, 24 Lower Leeson Street, Dublin 2. Telephone 789577 (5 Lines)

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Sydney, Melbourne & New Zealand Analysts
$A14,000-20,000
Applicants should have online experience preferably with TPS, and have written a system spec. for a major application.

$A14,000-20,000
Applicants should have a minimum of two years' 1900 experience. TPS experience an advantage. Interviews will be held in U.K. late November.

Programmers
London, Home Counties & Manchester
£3,000-£3,500
Large range of client companies require programmers with minimum of 18 months' experience preferably COBOL.

Analysts/Programmers
U.K.
up to £6,000
To develop and enhance systems. Experience in stock control, order entry, pay roll applications etc. an advantage. Must have implemented at least one major system.

Programmers
Manchester, Oxford, London
up to £6,500
To run a team of programmers and analysts, and to control and implement major systems.

Analysts
Oxford
Salary negotiable
The ideal candidate will possess extensive 1900/2900 experience and training skills. People with compatible experience in either programming and/or system design and a strong training motivation will be considered.

Registration/Enquiry

Name _____

Address _____

_____

Telephone Home _____ Office _____

Current Position _____ Age _____

Position Required _____ Salary Present _____

Required _____

Brief Career details _____

_____

_____

_____

Date _____

Signature _____

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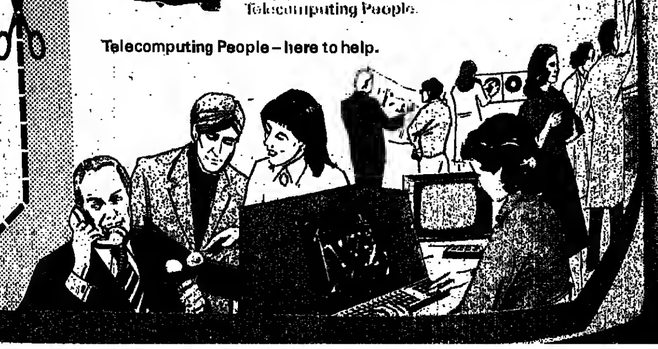

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* COBOL/ASSEMBLER programmers to work on software applications development.
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* PLAN programmers to work on software applicetions development.
* Junior programmers/analyst programmers to work on product quality assurance.

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* One years plus ASSEMBLER programming experience gained in any mainframe environment.
* One years plus PLAN experience.
* Two years plus COBOL experience gained in any environment.
* For junior positions at least six months programming experience is required.

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Computing Services Association

Shadow II Personnel

Rendack is a madium-sized international software house with offices in the Netherlands, England and the U.S.A. Our group of companies work in various fields and aspects of the computer industry with the main emphasis on database and data communications projects, and owing to our marketing of Shadow II in the Benelux countries, the majority of our teleprocessing work is concerned with Shadow.

We require Cobol programmers and analysts with at least one year's experience with Shadow to join our companies as part of our planned expension for early 1979. Successful applicants will work in one of our teams on projects in the Netherlands or in the U.S.A., where salaries, expenses and benefits will be well above average.

Initial interviews will be held in London throughout November.

Please write with personal details or telephone for an application form, when a mutual appointment can be arranged, to our London or Amsterdam office.

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PO1A £6,727-£6,342 inclusive of supplement

To lead a small team undertaking the planning, design and implemenation of various parts of the UTC signal network in the county, initially primarily in Bradford, and such other traffic signal work as is necessary. The post is based in Leeds.

Sound background in traffic engineering essential, particularly in the field of Control Systems and Traffic Signals, together with experience in Transyt. Professional qualification in relevent discipline required

Application forms may be obtained from Directorate of Planning, Engineering and Transportation, Room 230, County Hall, Wakefield and should be returned not later than 13th November, 1978.

Commercial On-Line | To £8,000

John Bell are looking for people with commercial and industrial experience in an on-line environment. We require staff with an in-depth knowledge of applications, operating systems, TP monitors, Data Bases, etc., at all levels.

Current applications include:
Automatic Warehousing
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Applications languages include COBOL, FORTRAN, CORAL and ASSEMBLERS on various machines. Locations are London and Home Counties, Munich and New York. For further information contact:

Carl James — Reading (0734) 413880 evenings only
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or at **Fleet (025 14) 28014 during office hours**

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Bermuda

Senior Engineer

BD $12,000-15,000 tax-free

Our Client is e distributoı ol computer herdwere end related systems based in Bermuda. A Senior Field Engineer is now required to cover instellation and support of Burroughs herdwaie (induding B1B00, 1700, 800, B0 ranges) end releted data communications equipment.
Spacific experience should include CPU, Multi Lane Control, Oiak pack, On-line Terminel Networks, Operating Systeme end Utility software. Further treining will be provided es required.
An ettrective lex free salery end relocetion package will be offered. Oue to work permit regulations, we regret thet only single candidates or those without children can be considered. Cliant interviews will be held in London during late November end early December. **Ref. 495/CW/Sarah Hurn.**

Croydon

IBM 370 and PDP/11s

Analyst/Programmer

c£6,000

Our Clients ere looking for en Analyst/Programmer with a good working knowledge of PDP/11 equipment end the RSX11-M operating system, plus familiarity with the design and implementation of commercial applications.

Systems Programmer

c£6,000

The candidate must be able to demonstrate an in-depth knowledge of OOS/VS, BAL end be experienced in the generetion and maintenence of DOS/VS operating system. Knowledge of CICS/VS, VM/CMS end OL1 is desireble but not essential es all nscessery training will be given. **Ref. 749/CW/Joen Ainsworth.**

Overseas Contracts

Current Contracts throughout Europe include:

C. Germany	— PDP11 RSX11. Commercial. An/Prog.
S. Germany	— M. Frame S/Ware. Des/Prog. IBM pref.
Yugoslavia	— H.L64. GCOS Support.
S. Germany	— IBM/Siemens COBOL/Assy. Prog.
S. Germany	— Mini/Micro S/Ware tools, compilers.
Paris	— French Ess. Telecom + Mini exp.
C. Germany	— IBM Syst/Prog. OS/VS2 pref.
Holland	— PDP11 — Datacom. Applic + S/Ware.
Switzerland	— Basic S/Ware development. PDP11 or sim.

Plus:

U.S.A.	— H6000/L66 COBOL. IDS. Prog.
Middle East	— H6000/L66 GCOS S/Ware. Dev/Supp.

Retes ere up to £230 p.w. in the U.K. end up to £400 p.w. in other locations + tax benefits. **Please contact Roger Allington quoting FL1/RA/CW for further details.**

Herts

Programmers

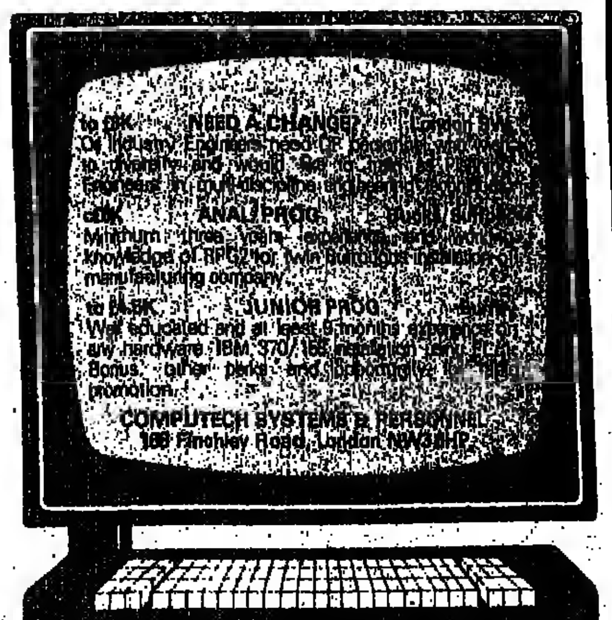
£4,500 - £7,000

An independant British manufacturer is expanding its Design Division. Here is a chance to work on FILING SYSTEMS, to contribute ideas for the future development of data storage end access methods. Or, to work on the enhancement end development of LANGUAGE COMPILERS (COBOL, CORAL or FORTRAN). For both these vecencies you will need et least two yeers' related experience end a degree in Computer Science.

There is also a vecency for e systems programmer to work on EXECUTIVE SOFTWARE, initially working on a new magnetic tape driver. In order to be successful you should heve et least two years' experience of ASSEMBLER, experience of writing interrupt code, knowledge of multi-tesking opereting systems end of magnetic tepe driving at e low level. **Raf. 157/CW/Fran Setter.**

To apply for any of the above positions or for further information, please telephone the Consultant concerned during working hours on 01-242 9356, or write to the above address.
If it would be more convenient to telephone in the evening, or at weekends, the telephone numbers are:
Roger Allington — Berkhamsted (04427) 2299, Sarah Hurn — 01-673 0205, Fran Setter — 01-874 6372.

Members of Computing Services Association



COMPUTECH 01-794 0202

UNIVERSITY OF NOTTINGHAM CRIPPS COMPUTING CENTRE

Applications are invited for the post of

SYSTEMS PROGRAMMER

The Centre operates a linked ICL 1906A/1904S configuration under the George 3 operating system, together with two DEC PDP11/40's providing data preparation and screen editing facilities, and a CTL MOD 1 providing BASIC. The Centre is also actively participating in the development of a new regional network which will fully interconnect the main computing services of the six Midland Universities.

The successful candidate will be required to work in a group providing user and operations support (planning and advisory services, production of utilities and applications packages, validation and support systems software) and to contribute to the Centre's development projects (including operating systems, accounting and budgeting, workflow scheduling and online networks).

Experience of scientific programming language is essential (preferably FORTRAN, ALGOL 60 or ALGOL 68).

Initial salary will be in a range of £5,804 (under review) with USS according to age and experience.

Further particulars and forms of application, returnable not later than 27th November, 1978, from the Staff Appointments Officer, University of Nottingham, University Park, Nottingham NG7 2RD Ref No. 638.

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All levels of experience considered. Experience of B3 and on-line operations useful but not essential.

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The ideal applicants will be qualified to HNC level, but formal qualifications are less important than an ability to communicate with clients and Systems Engineers and to implement solutions to the problems in microprocessor assembly language.

Salary will be negotiable according to experience.

Interested applicants should write or telephone for an application form or submit a resumé in confidence to Miss Pat Anderson, Personnel Manager, Daniel Industries Ltd., Lochlands Industrial Estate, Larbert, Stirlingshire FK5 3NS, telephone Larbert 0111.

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Please apply in writing to.
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SYSTEMS MANAGER, at least 5 years' experience in D.P. with IBM Systems 3 Hardware using RPG II. Area Stoke-on-Trent. Salary to £8K Ref M28.
PROJECT LEADER, at least 5 years in IBM Systems specialising in Financial applications. Area Birmingham Salary to £7K. Ref: SA185
SYSTEMS ANALYSTS, 2 years' plus experience using On-line and Batch Systems Using CICS/VS and IMS. Area Birmingham. Salary. c£5.5K. Ref SA09
SUPPORT ANALYST/PROGRAMMER required by established Software house specialising in Mini Computers. 2 years' Basic + or similar language. Real time applications. Area Nottinghamshire Salary to £5K. Ref. SA38.
SYSTEMS ANALYST required by International company in the electronics industry 18 months' plus experience on Main frame or Mini using Real time applications. Area Swindon Salary c£5.5K Ref SA88.
SYSTEMS ANALYST required by Engineering Group. 18 months' plus Systems experience, preferably with IBM Hardware. Area Rugby. Salary c£5K. Ref SA95
SYSTEMS ANALYST, at least 18 months in Systems or O & M Area Grantham. Salary c£4.7K. Ref SA98.
SYSTEMS ANALYST, at least 2 years' systems experience together with Cobol or a Mini language. Modern offices. Canteen. Flexi time, etc. Area Birmingham. Salary c£5.5K. Ref SA128
SYSTEMS ANALYST, 2 years' plus experience with a Cobol programming background Area Northamptonshire Salary. to £5.5K. Ref SA188.
SYSTEMS ANALYST has at least 2 years' system experience including use of ON-LINE facilities Area Halesowen Salary to NEG. Ref SA186.
SYSTEMS ANALYST at least 3 years in DP with formal COBOL background. Area Bath Salary to £5.5K Ref SA195
PROJECT LEADER to head new team specialising in real time production control systems, experience with minis Area Birmingham. Salary to £6.5K Ref SA194
PROJECT LEADER at least 5 years in implementing systems software or packages with IBM Hardware new project work. Area. Rugby Salary to £6.25K Ref P156
SENIOR ANALYST/PROGRAMMER directly responsible to DPM at least 5 years in DP with sound working knowledge of RPG II Area Near Birmingham Salary to £6K Ref. P377
SENIOR SYSTEMS ADVISER for main frame manufacturer At least 4 year commercial systems including knowledge of COBOL or RPG II. Area Leicester or Bristol Salary c£6K plus car allowance and generous expenses. Ref. SA129
PROJECT LEADER at least 5 years in DP including design of commercial ON-LINE systems for minis using BASIC + Area Staffs. Salary c£6,000 Ref P32
SYSTEMS ANALYST at least 18 months' experience in financial applications. Area Birmingham. Salary c£4.5K plus low interest mortgage. Ref SA172.
SYSTEMS ANALYST around 3 years' DP experience with I.C.L. hardware. Area Coventry. Salary NEG Ref SA149.

SYSTEMS ANALYST at least 4 years' experience in I.C.L. 1900 and minis. Area Somerset Salary to £5K Ref SA146
SYSTEMS ANALYST, 2 years' plus experience any hardware Area Leicester Salary to £5,500 Ref SA141
ANALYST/PROGRAMMER at least 18 months' experience on I.C.L. 1900 under George II developing real time applications. Area Leicester Salary c £5,500 Ref SA132.
TECHNICAL SUPPORT ANALYST/PROGRAMMER at least 2 years using high level or basic language. Area Birmingham. Salary c£5,000 plus company car and expenses. Ref SA197.

SENIOR PROGRAMMER/ ANALYST PROGRAMMERS

PROGRAMMER/ANALYST, 2 years' plus Cobol with Production control or IMS experience. Area Staffs. Salary c£4½K, Ref P125.
PROGRAMMER/ANALYST, at least 2 years' plus RPG II. Area Worcestershire Salary to £5K. Ref P342.
SUPPORT PROGRAMMER required by Mainframe manufacturer, at least 18 months in RPG II or Assembler language Area: Nottinghamshire Salary to £5.5K plus expenses. Ref P321.
PROGRAMMERS required by West Midlands Software House. At least 2 years' experience in RPG II, Cobol or Mini language. Salary range. £4K-£7K plus expenses. Ref P387.
SENIOR COBOL PROGRAMMER, at least 3 years' experience using Real time applications. Knowledge of Order stock system an advantage. Area Leicestershire. Salary to £5.5K. Ref P362.
PROGRAMMERS, at least 18 months' Cobol any Hardware. Area: Coventry. Salary c£4.5K, Ref P258.
SENIOR PROGRAMMER, at least 4 years' programming in TOS and Assembler. Mainly financial projects. Area Gloucestershire. Salary, to £5K. Ref P358.
PROGRAMMERS with PL/I or Assembler experience. Area Burton-on-Trent Salary to £5.5K, Ref. P357.
SENIOR PROGRAMMER at least 2 years' COBOL preferably experienced on financial ledger, payroll, or production control. Area Loughborough Salary c£5K. Ref P245.
TECHNICAL PROGRAMMER/ANALYST at least 12 months' programming in Fortran or similar language. Area Birmingham or Rugby Salary to £4.5K. Ref. P287.
PROGRAMMER/ANALYST at least 18 months' working with minis. Area Swindon Salary to £4.5K. Ref. P378.

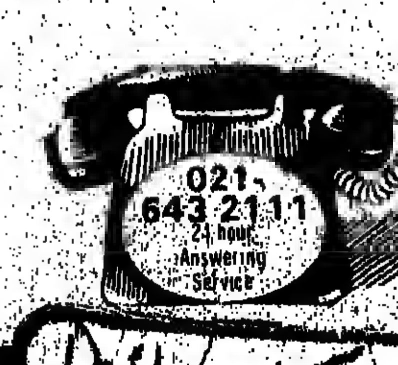
OPERATORS

OPERATOR, at least 1 year operating ICL 2903 or 1900 under George II Area Northamptonshire Salary to £4,250. Ref OP122
TECHNICAL SUPPORT ASSISTANT. Several years' experience in IBM 370 operations with sound knowledge JCL and also a knowledge of systems programming Area Staffs Salary £4.5K-£5K according to experience. Ref OI39.
DATA 100 OPERATOR. Continual shift system, at least 1 year's terminal experience Opportunities for transfer to programming. Area Nottingham. Salary, £3.5K plus S-A. Ref O140
SENIOR COMPUTER OPERATOR. Double day shift. 1 year's plus experience on IBM 370 using DOS/VS Area Birmingham Salary to £3.5K Ref O129
COMPUTER OPERATOR. One year plus experience operating ICL 1900 or Univac. Area Coventry. Salary to £3.7K Ref O131
OPERATIONS TEAM LEADER. At least 3 years' ICL 1900 experience with sound knowledge of George III. Area Wilts Salary £4.5K Ref. O138
OPERATOR. At least 2 years' operating IBM 370 under OS/MVT A chance to operate both IBM and Amdahl hardware Area Coventry. Salary package to £4,350 plus paid over time. Ref OP115

We have many more D.P. positions on our register in all areas of the Midlands/West Country

Contact: Graham Aston, M.E.C.I.
MARTINS COMPUTER SERVICES, First Floor, Western House, Opposite Albany Hotel, Smallbrook Queensway Birmingham B5 4HQ. telephone 021-643 2111. 24-hour answering service Evenings and weekends 021-454 0331

We are now able to interview until 5.30 p.m. and Saturday morning by appointment.



SALES EXECUTIVES-NORTHERN ENGLAND

YOU CAN IGNORE THOSE £14,000 ADS. ONCE TOO OFTEN!

Probably because you've seen too many of them, and we would have to agree with you. However, from time to time a company does get its priorities right and offers rewards which genuinely reflect a realistic quota and offers incomes based on fact — not supposition.

Our clients have proved that by providing excellent systems, support and real career opportunities. The **majority** of their Sales Executives are earning at a substantially higher level than most in the computer industry. This major international manufacturer of small/medium computer systems has shown a dramatic growth over the past 2 years, and is able to offer probably the best career development structure in the industry, indeed, for the right calibre salesmen, the first rung of the management tree could be available now.

So, if you are looking for an income genuinely c. **£14,000** plus, promotion and real prospects, phone the Advising Consultant **now** quoting Ref. No. CW 181.

INSIGHT MARKETING & PERSONNEL CONSULTANTS LTD.
72-75 MARYLEBONE HIGH STREET
LONDON W1M 4AJ
Tel: 486 5644

SALES MANAGER DESIGNATE
WEST COUNTRY

Are you looking for the opportunity to move into Sales Management?

Our client, a large international Computer Manufacturer, is establishing a new branch in the West Country, as part of their expansion plans for local marketing, sales and support of their very successful range of small business computer systems.

The position, initially, is Senior Sales Executive, with responsibility for establishing the new Branch, and managing the current staff of four sales and systems personnel. This exciting opportunity will appeal to candidates who are seeking their first real management role with a company dedicated to success.

Initially, you will receive, as Manager Designate, a good base salary, guarantee and targeted earnings of c. **£13,000** (most are earning **£15,000+**), plus an excellent tax-free car and mileage allowance.

The success of the product has created a significant number of enquiries, and qualified 'leads' await the successful candidate.

For further information regarding this genuine **career** opportunity, please telephone the Senior Consultant quoting Ref. No. CW 179.

INSIGHT MARKETING & PERSONNEL CONSULTANTS LIMITED
72-75 MARYLEBONE HIGH STREET
LONDON W1M 4AJ
Tel: 486 5644

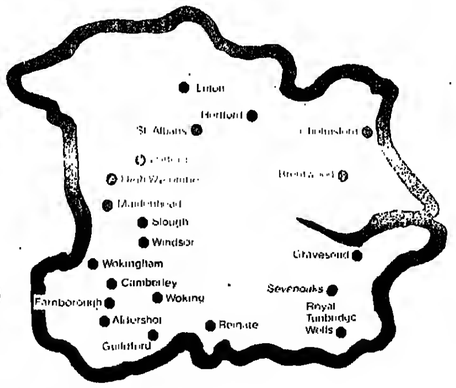
Isn't it time you KO'd that computer recruitment problem?

Next week you can be on the air and in print with

COMPUTER WEEKLY'S
NEW ONE-TWO

1 ON THE AIR
48,000* D.P. professionals in the Greater London radio area are told to watch out for your advertisement in that week's Computer Weekly!

2 IN PRINT
Your potential employee will have received Computer Weekly at home or at the office and can immediately turn up your ad!



How the scheme works

It's a unique opportunity to tie in your Computer Weekly recruitment ad. with a spot on popular Capitol Radio — at very low cost. The radio ad. will give tempting outline details of your company and the job you are offering — and will then refer the listener to the appropriate page of Computer Weekly.

When it happens

It will be broadcast during the morning breakfast-and-drive-to-work period on the Friday of the week in which your advertisement appears. Younger prospects, who are probably late-evening listeners, will already have heard it late on the Thursday night.
Each advertiser gets approximately 6 seconds of a full minute-long Computer Weekly commercial. So you share in the cumulative impact of sixty seconds of computer-oriented broadcasting time, at a fraction of the cost of a full "job-spot" commercial.

Free production

What's more, Computer Weekly will produce your commercial spot free of charge, with highly professional studio and production facilities.

Cost and Conditions

The rate is £120 for a commercial spot of approx. 6 seconds on Capital Radio on both the Thursday and the Friday of the week your advertisement appears.
The copy date remains at 12.00 Tuesday for a broadcast on the following Thursday and Friday. Extraction of the key points from your advertisement will be done by our expert staff — unless you yourself have indicated the points for inclusion.
Unfortunately the salary offered cannot be announced over the air, due to the dangers of an escalation in DP staff salaries.
Demo tapes are available for seriously interested advertisers.

RING CHRIS PRIOR ON 01-261 8028/8658/8000

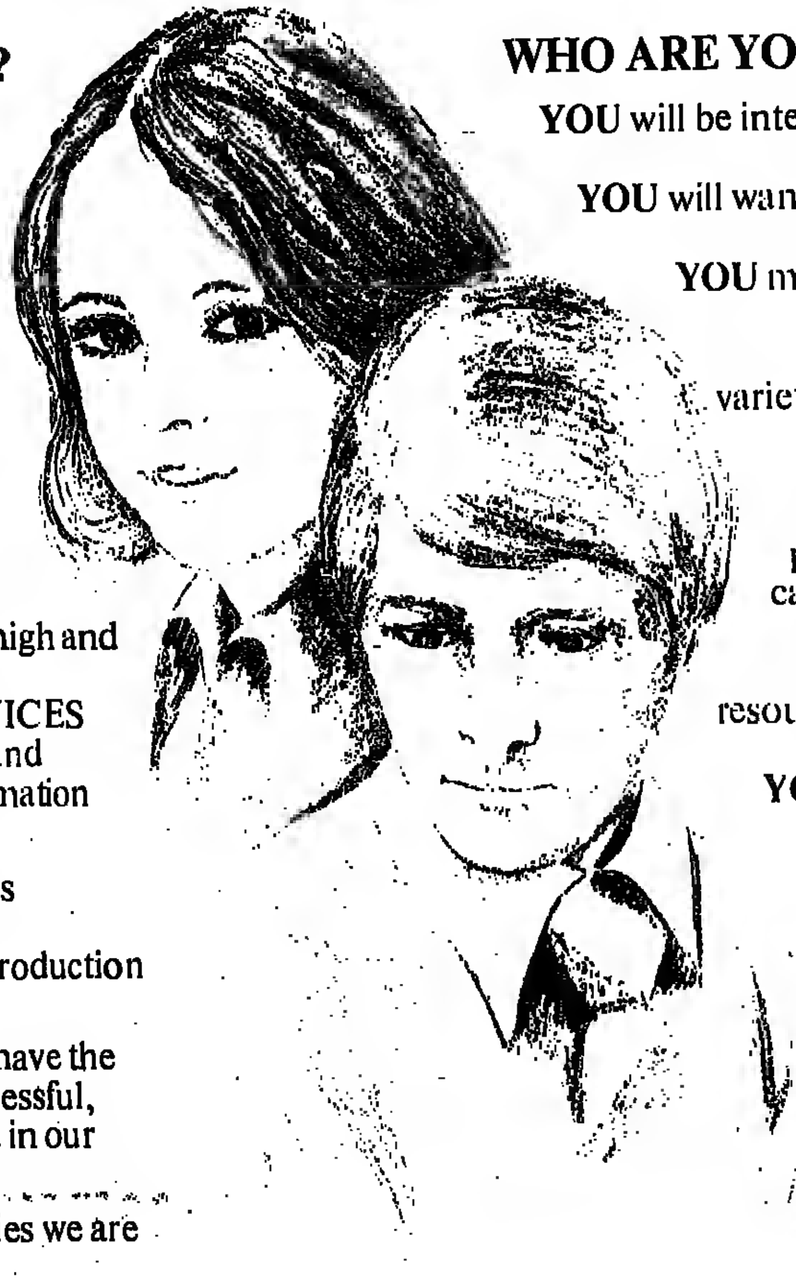
But hurry! Bookings are strictly rationed until Dec. 1978!
Computer Weekly. The industry journal for the data processing professional.

*Computer Weekly circulation in Greater London area Sept. 1978

COBOL PROGRAMMERS

(WITH A MINIMUM OF TWO YEARS' EXPERIENCE OF COBOL)

UP TO £7,000.



WHO IS CONTROL DATA?

WE are a world leader in the provision of computer products including, LARGE-SCALE COMPUTERS, COMPUTER PERIPHERALS, COMPUTER SERVICES, COMPUTER SUPPLIES and COMPUTER-BASED EDUCATION.

WE employ 41,000 people world-wide to whom we have a positive commitment for individual training and career advancement within an environment where company growth is exceptionally high and investment considerable.

Our PROFESSIONAL SERVICES DIVISION works with industrial and commercial concerns to solve information problems including:

* Financial Planning and Business Management.
* Commercial Accounting and Production Control.

WE require top class people who have the inherent characteristics to be successful, these people play an essential part in our continual growth.

If you believe you have the qualities we are seeking–please read on:

WHO ARE YOU?

YOU will be intelligent, enthusiatic, articulate and self-motivated.

YOU will want to work on the latest IBM equipment (IBM 3031 under MVS).

YOU may be bored with working on the same type of problems in your current environment and want to work on a variety of problems within many industries.

YOU should have a minimum of two years' experience of COBOL.

Above all you will have identified a personal desire to take up a progressive career and be seeking the opportunity to learn the related skills with a company who has both the commitment and resources to provide the necessary on-going training.

YOU may not be seeking to change your job right now, but just compare your present career opportunities with those available from CONTROL DATA.

* Continual training and personnel development.
* Wide variety of applications and industries.
* Many opportunities for promotion.
* High income with regular performance-related reviews.
* 'Big Company' security and benefits.
* 'Keeping up with the Af...

IF you have relevant experience and believe your talents could be better utilised this could be the opportunity you need.

Please apply to: Caroline Connabeer
SMR Sales and Marketing Recruiters LTD.,
4 Tavistock Place, London WC1H 9RA. Telephone: 01-837 2281

CONTROL DATA

MORE THAN A COMPUTER COMPANY

1978

Magnetic Media Manufacturing Division

COMPUVAC COMPUTER SERVICES

SYSTEMS & PROGRAMMING

SYSTEMS SUPPORT to £9,000
This job requires an in depth knowledge of ICL 2900 VME B software W London

ANALYSTS to £7,000
This large London based bureau offers a high degree of customer contact. You will be working on new systems, or re-designing existing ones. If you have some commercial systems experience and would like more details, call us now!

COBOL PROGRAMMERS to £5,900
This West London company offers exceptional prospects. If you have a background of commercial cobol and are ambitious call for further details.

ALGOL PROGRAMMERS to £6,500
Current vacancies exist for people with a background of scientific programming in Algol 60 or 68 North London, West London and Surrey

CONTRACT PROGRAMMERS to £280 p.w.
For our latest contract requirements in London and the Home Counties, call Chris Green now!

OPERATIONS

ICL OPERATORS to £8,500
This London based bureau offer high financial rewards and tremendous job satisfaction for experienced 1900 & 2900 ops.

IBM SHIFT SUPERVISOR £6,300
Responsible supervisor required for top retail organisation. You need at least 5 years' experience of 370 DOS POWER/VS, and be capable of translating to 3030's next year.

NCR OPS £4,800
Any NCR mainframe experience? Investment company offers immediate opportunity to extend skills on latest equipment.

IBM SUPPORT. DAYS ONLY £5,000
Central London, Croydon, Middx. You should have a thorough working knowledge of 370/OS JCL & UTILITIES, plus the ability to 'communicate' and work under pressure.

JUNIOR OPERATORS.
TOP PROSPECTS to £4,000
Any ICL experience provides the entry to the ICL NEW RANGE 2960's within the Insurance business.

Large IBM user, in the shipping trade, are seeking junior staff to develop their knowledge on the latest 370 operating systems. For all the best operating and data-control jobs, CALL NOW and speak to ex-operators who know the game!

COMPUVAC

01-248 6367 24 hour answering service

AUTOMATED OFFICE SYSTEMS –EUROPEAN SUPPORT

To £8500 pa. plus company car

An exciting opportunity has occurred to join a small, fast-growing team of professionals marketing and supporting the Jacquard range of Videocomputers throughout Europe. The position, based at Jacquard's headquarters in High Wycombe, Bucks. requires extensive travel throughout Europe and will be suitable for candidates either male or female with the following experience:–

- 5/6 years programming and installing mini-computers, including the use of BASIC language
- word processing
- applications software, particularly business packages
- training

We are seeking a self-reliant marketing oriented person with the flexibility to understand customers' problems and operate in a sales environment. The likely age range is between 25 and 30 years and the ability to speak French or German would be an advantage. Salary is negotiable to £8500 per annum and an attractive range of benefits including a non-contributory pension scheme, free membership of BUPA and an annual bonus is provided.

Applications should be sent in writing to:
Mr. T. W. Hart
Managing Director
Jacquard Systems Ltd.
Bridge Street
High Wycombe
Bucks.
Tel. 0494-41256

Jacquard Systems

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oxford polytechnic

Computer Centre

Principal Systems Analyst

(PO1A £5,727-£6,342)

The Analyst will be responsible to the Registrar for setting up and maintaining a comprehensive management information system for the Polytechnic.

Application forms and further particulars may be obtained from the Deputy Administrator, Oxford Polytechnic, Oxford OX3 0BP.

CONTRACT PROGRAMMERS

urgently required with the following experience:

IBM 370 RPG II
Burroughs 8700 COBOL
IBM MTC8

Top rates — weekly paid

Focus Computer Services (Emp. Agy.)
28a Devonshire Street, London, W.1
Tel: 01-487 5781

IBM 3031

O.S. PROGRAMMERS & ANALYSTS HOME COUNTIES £5.5-7.5K p.a.

If the idea of working on the latest IBM 3031 processor appeals to your career ambitions and you are an informed O.S. COBOL programmer or an Analyst/Programmer then our household-name client can fulfill that ambition and pay you handsomely in the bargain. Does financial accounting, data capture, stores inventory and similar commercial applications correspond to your experience? Does the possibility of working on sophisticated database applications intrigue you? Then why not let us arrange an immediate and confidential meeting with our client at your convenience? Dependent upon your experience and potential we anticipate salaries at the following levels:

Senior Appointments: £6-8,000 p.a.
Other Appointments: £5-6,000 p.a.

These appointments must be classified as offering top career advantages coupled with training opportunities and an unrivalled environment. Full relocation expenses will be met by our client wherever applicable and a comprehensive range of fringe benefits is offered.

MATRIX

Telephone 01-491 4434 (30 Lines)
200 Oxford St. London W1N 9HA.

Telephone: 01-947 7411

Cross Computer Group Ltd.
Berry House
20-22 Worple Road
Wimbledon, S.W.19

9th October, 1978

Dear Analysts and Programmers,

Next week we will be featuring a large advertisement for Analysts (Commercial and Financial) and Programmers (COBOL or RPG) to work in our interesting Consultancy and Software House environment. One of our major projects is a complex on-line system, so experience in this area would help. (We have our own computer for interactive development).

Although primarily requiring permanent staff, we could also be interested in a small number of contractors.

If you cannot wait for full details next week please phone or write to George Gillespie or myself, immediately.

Yours sincerely,

STUART HOWARD
Programming Manager

INMS *******

STAR OPPORTUNITIES SHEFFIELD

Our client wishes to recruit the following additional dp staff.

SENIOR SYSTEMS ANALYSTS
c £6,000

SYSTEMS ANALYSTS
c £5,500

SYSTEMS PROGRAMMERS
c £5,500

These positions, with a progressive company, offer excellent long-term career prospects and involve the development of extensive new systems covering all aspects of the company's operations.
Good salaries. Relocation expenses.

Invitation

INMS requests the pleasure of the company of Systems Analysts and Systems Programmers to discuss these outstanding opportunities at an

Open Day at the
Grosvenor House Hotel
Charter Square, Sheffield
Thursday 16th November 1978 9.00 am to 9.00 pm
Telephone: Sheffield 20041
No appointment is necessary.

If you cannot accept this invitation please telephone to make an alternative appointment.

Ivor Norton Management Services Ltd
Recruitment Consulting Division
P.O. Box 63, Copthall Tower House, Harrogate HG1 1TS. Tel. Harrogate 66628.

CLASSIFIED COPY

All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday. Ring Ian Carter for further details on 01-261 8016.

"P and who?"

"P & S, Programming and Systemsolve"

"Oh, Programming and er . . . and . . ."

"Just remember P & S"

"Oh yes, P and er . . ."

"Phew, I wonder if P & O have this trouble?"

OK, so we're not a household name, but you can bet some of our clients are.

The positions registered with us cover the whole DP spectrum, from COBOL programmers to systems analysts, to high-flying salesmen. They are located throughout the UK and the salaries will match your experience and ability.

So just ring us or fill in the coupon and remember P & S is the name.

Name ....

Address ....

....

Tel no ....

Position sought ....

30 Baker Street
London W1M 2DS

9-11 Tatton Street
Knutsford
Cheshire WA16 6AB
Tel: 0565 4926

Programmers, Analysts Project Leaders

If you wish to work in the North try us for size

PMSL is the Computar Services Compeny within tha Provident Finencial Group. Thay provida a comprahansiva data processing service to the Group and external users. Continuad expansion has created a need for additional developmant staff at all levels, to supplement the existing team based at the new purposa-built pramises in rurel surroundings just outside Halifax, West Yorkshire

At PMSL wä ara sure you could find a job that fits! The range of applications and equipment cen elmost certeinly meet your requirements.

Equipmant includes a Univac 1106, 2 x ICL 1904s, minis and micros end plans for substantial naw equipment in the near futura.

As well as a first-class salary, we can offar raally worthwhila banefits including:

- ★ 4 waaks' holiday
- ★ Quartarly review periods
- ★ Subsidised rastaurant
- ★ Discount shopping
- ★ Substantial training
- ★ Pension and life assurance schame
- ★ Genarous relocation package

Most applications ara based on communicetions and data basa techniques. If you have this typa of experience or would like to get involved with really modern systams devalopmant, we would like to talk to you. With this in mind, wa hava erranged for membars of our davalopment team to be availabla to talk to you at fiva diffarant locations in the North, Midlands and London during tha week commencing 13th Novembar.

If you are unable to attend tha informal interviaws, then telephone or write to Mike Sands quoting ref. 2040/CW

Provident Management Services Limited

INFORMAL INTERVIEWS

Tuesday, 14th November
The St. Georga's Hotal
Langham Placa, LONDON, W1

Wednesday, 15th November
The Metropole Hotel, King Street
LEEDS

Wednesday, 15th November
The Portland Hotal
3-5 Portland Straat
Piccadilly Gardens
MANCHESTER

Thursday, 16th November
The Royal Victoria Hotal
Victoria Station Road
SHEFFIELD

Friday, 17th November
The Plough & Harrow Hotal
Hagley Road
Edgbaston, BIRMINGHAM

Computing Services Association

WE ARE ALWAYS INTERESTED IN HELPING YOU WITH YOUR CAREER
Goldsmith Recruitment International Ltd., 15 Buckingham Palace Road, London S.W.1.
Tel: 01-828 5356 – 24 hour answerphone service.

JOHN GOLDSMITH (Computer Recruitment) Ltd.

You've got two days to find the job of a lifetime

November 17th & 18th

To talk informally about your career with our top management at the BRITANNIA HOTEL, GROSVENOR SQUARE, W.1. come to the Grosvenor suite between 9 am & 8 pm on either day and we'll tell you why we're the most successful and fastest growing computer company in the business today.

Senior Sales Executive – on target c£16,000 + car
A proven track record as e computer sales professional with mainframe/mini experience in generel data processing and a good knowledge of scientific and/or commercial epplications will open the door.

Motivation, determination and personality is what you need in our highly professional sales team where achievement spells high rewards.

Support Consultants – to £8,500 + car
Experienced in pre/post sales situations covering scientific Engineering and/or Commercial Applications on mainframe or mini computers. You will have a degree or higher diploma with a thorough working knowledge of one or more of the following areas: File Management Systems, Database, Operating Systems, Language Compilers, Graphics, Scientific and Commercial applications.

Senior Training Specialist – (Database) to £7,500 + car
This industry recognised professional team has established a high reputation for designing and implementing customer training courses. To join us you need a solid commercial background with COBOL and 3-4 years experience of Databese Systems.

An excellent career opportunity can be yours as PRIME's Database (DBMS) is CODASYL compliant and a market leader.

Field Engineers – to £7,000 + car
Your preventive and corrective maintenance experience either in PRIME's product lines or with similar equipment, will sharpen your chances for e top career in a top team. Naturally you'll be expected to test and install new equipment end underteke challenging modifications, beceuse you're self-motivated end heve the ability to setisfy our customers. With an HNC/ONC in Electricel Engineering or City and Guilds Telecomms you'll elso have e minimum of two years experience in the industry.

We are looking to fill these and other positions in the following locations: Glasgow, Manchester, Birmingham, Bedford, Maidenhead and London.

You'll have excellent career prospects with PRIME enjoy en extensive renge of benefits and most of all, be with No 1.

If you can't come in on the 17th or 18th please write to Roger Parsons – Marketing Director or call us anytime – 01-572 6241. We'd like to hear from you.

PRIME Computer (U.K.) Limited,
The Hounslow Centre,
1 Lampton Road,
Hounslow, Middlesex.

PRIME

CONTRACT

PROGRAMMERS

CAN YOU OFFER US EXPERTISE IN:

1 OS/DOS COBOL (urgent)
2 1900 COBOL
PLUS ANY ONE OF THE FOLLOWING WOULD BE HELPFUL: PLAN, DRIVER, FILETAB, GIII, GIII
3 2903/SYS 3, RPG II
4 SYSTEM 10, 15 — ASSEMBLER
5 ASSEMBLER, PL/1, CICS

WE WILL OFFER YOU

- ★ A personal health scheme covering sickness for 6 months
- ★ Regular and prompt payment.
- ★ Tax guidance service
- ★ A professional attitude towards YOUR requirements.

If you are a professional and want to be treated like one contact:

PETER TUGGEY at
DIRECT PROGRAMMING SERVICES
51 LONG LANE, WEST SMITHFIELD
LONDON, EC1
Tel. 01-606 1738/1739/1730
(24-hr. service)

Licence No. SE(A)3081

Contract
Urgent

Univac 1100 Cobol
LONDON

IBM DOS Cobol
LOCATION BRUSSELS

Phone: Paula
01-946 4424
METEOR

City of Manchester
Treasurer's Department
System 4

Computer Operators

The City Council is to introduce 3 shift working on an I.C.L. System 4/72 computer in January 1979. The present configuration includes 512K bytes store, 19xEDA 80/30, 7 & 9 track Mag. tape and a large on-line communications network. Additional operators will be required and applications are invited from suitably qualified operators for the following posts.

Senior Operator

(Deputy Shift Leader)—with a minimum of 3 years' experience of System 4—J operating system—Salary £3,868-£4,908 p.a. inclusive.

Operators

—with a minimum of 2 years' experience of System 4—J—Salary £3,321-£4,314 p.a. inclusive.

Junior Operators

—with a minimum of 1 years' experience of System 4—J—Salary £2,121-£3,868 p.a. inclusive.

All above salaries are inclusive of shift allowance for 3 shift working and supplement of £312 p.a. The average working week is 35 hours, and other conditions include excellent sickness and pensions provisions and leave entitlement. A contribution may be made towards removal expenses in appropriate cases. A new computer is envisaged in the early 1980's.

Applications stating age, qualifications, experience to date, and the post applied for, should be addressed to the City Treasurer, P.O. Box 314, Town Hall, Manchester M60 2JR.

The City Council operates a Union Membership Agreement under which a new employee is required to become a member of a recognised trade union.

DATABASE

SENIOR DATABASE ADMINISTRATORS & DESIGNERR—LONDON & EUROPE

The U.K. and European divisions of a U.S. public Corporation have openings in their London & Zurich offices for Senior Database Administrators, Designers and Applications personnel with extensive Database experience using any of the proprietary DBMS currently in use on major main-frame and mini systems. Of particular interest are persons with expertise in IMS, TOTAL, ADABAS, CMS, IOMS etc. Hardware backgrounds are of little importance — what is essential is the depth of expertise in your relevant area of Database expertise. Our client is anxious to establish it's prestigious standing world-wide by creating proven and potential talent to join them in the development of advanced Database projects in commercial and technical environments.

Grade I Salaries £12-16,000 p.a.
Grade II Salaries £7-11,000 p.a.

The opportunity to travel within Europe and the U.S. is available. Interviews will be held in London during the next three weeks.

MATRIX

Telephone (01-491 4634 (10 lines))
340 Oxford St. London W1N 9HA

SALES MANAGEMENT—NATIONAL ACCOUNT

c. £15,000 p.a. + + +

Have you sold £½million systems (or larger)?
Can you sell at very senior levels?
Can you manage large sales campaigns?
Can you manage and grow existing large installations?

Would you like a Sales Management position, and the prospects of an excellent career with a Major International Computer Manufacturer?

The money is excellent. You will earn approx. **£15,000** p.a. with prospects for much more. First year guarantees are made up of base salary and non-returnable guarantees equalling **£10K-£12K.** Commission / bonus paid in addition.

This is a superb opportunity to join a professional company at management level, who look after their people.

Please telephone the Senior Consultant quoting Ref. No. CW 180.

INSIGHT MARKETING & PERSONNEL CONSULTANTS LTD.
72-75 MARYLEBONE HIGH STREET
LONDON W1M 4AJ
TEl: 486 5644

In the New Year you could be with a small progressive team developing application packages for worldwide distribution, working for the UK Division of Burroughs International, you will be based in Feltham just 21 minutes from Waterloo.

If you are self-motivated, capable and ambitious, these new positions in the Applications Research and Development Centre will allow you to utilize and broaden your experience in developing new banking and commercial systems.

PROJECT MANAGER (1)
SNR. SYSTEMS ANALYST (2)
SNR. COBOL PROGRAMMER (1)
SYSTEMS ANALYST (2)
COBOL PROGRAMMER (2)
JNR. ANALYST (1)
JNR. PROGRAMMER (1)

£4600-£8000 (neg.)

In addition to challenging and rewarding career paths, Burroughs offer high salaries and many opportunities for international travel.

Although an understanding of foreign exchange, accounting or banking procedures would be useful, Burroughs will provide comprehensive and ongoing training schemes whatever your data processing experience.

Burroughs — 'A success story' — join them in 1979 and achieve further success together . . .

Burroughs

'Fifteen years ago it was widely predicted that Burroughs together with the likes of GE and RCA, were doomed. Now they are the number two company in the industry and the only one that has come consistently close to matching IBM in the ratio of net profit after tax to sales. The financial record over 15 years shows nothing but astounding success . . .

Reproduced with permission from COMPUTER TALK 27/10/78'

EUROPEAN OPPORTUNITIES

JUNIOR PROGRAMMER

Can you speak French, Germen end RPGII? Manufacturing Compeny is looking for a young (22-30) Programmer to support installations in FRANCE and Germany. The successful applicant would be nominally based in Hampshire, but would spend about Two Thirds of the year abroad. A European level salary end very generous expenses make the financial package extremely attractive.

For an interview THIS WEEK phone Continental CLAIRE, and quote REF. 248.

TRAINEE COMPUTER ENGINEERS

FRANKFURT AU-MAIN

A large American Meinframe manufacturer has a numbar of vacancies for TRAINEE SERVICE ENGINEERS to work on a U.S. Government Contract in Germany. Whilst experience in Computer Systems is *not* necessary, all applicants MUST have had some Formal training in Electronics, and will have to take an aptitude test as part of the selection process.

Full training in Computer systems end relocation for both applicant and femily will be provided.

Phone VERA and quote REF. 248.

KEY COMPUTER PERSONNEL

01-949 5851

FEDERATED DUBLIN VOLUNTARY HOSPITALS

COMPUTER DEPARTMENT

Configuration consists of 32K I.C.L. 2903 with EDS60, FEDS and DDEs. This system also links to an I.B.M. 370/158, an I.B.M. System 3 and other computer equipment used in Laboratory environments.

To support our system development plans vacancies exist for:

A) ASSISTANT COMPUTER OPERATIONS MANAGER

SALARY: £4,888-£5,898

The successful applicant will be responsible to the Computer Operations Manager for the day-to-day running of the installation and the direction of Operations and Control Staff.

Duties will include job scheduling, security, close liaison with Users, systems, and maintenance of procedures.

Ideally, candidates should possess:

1. Minimum of three years' Computer Operations experience, preferably in an I.C.L. environment
2. Be well attuned to the realities of the operations environment and capable of maintaining a tactful and constructive approach despite its pressures
3. A knowledge of both I.C.L. and I.B.M. procedures

B) JUNIOR PROGRAMMER

SALARY: £2,570-£3,212

At least one year's experience in Cobol and or RPG2. This is an opportunity for a Programmer to be fully involved in the integration of new systems with a developing Computer Department.

Further particulars and Application Forms may be obtained from:

THE PERSONNEL OFFICER
FEDERATED DUBLIN VOLUNTARY HOSPITALS
P.O. BOX 798, JAMES'S STREET, DUBLIN 8

to whom completed Application Forms should be returned not later than Friday, 17th November, 1978.

LEICESTER CITY COUNCIL
Personnel and Management Services Department
Computer Services Division

OPERATIONS SHIFT CONTROLLER

£4245-£4832 p.a.

To be responsible for the progression of a critical work schedule during specified shifts through the City Council's

IBM 370/138 COMPUTER SYSTEM

We work on a two shift basis from 08.15 hours to 24.00 hours, Monday to Friday. The successful candidate would be responsible for, and supported by, an operating team, control and services staff, and a data preparation team.

Applicants should have operating experience and a broad knowledge of computing activities. If you consider that you have the experience and stature to manage a shift's resources, then we want to hear from you.

The post offers a shift allowance of 14% and 22 days' leave per year.

The starting salary will be dependant upon experience and qualifications. Working conditions in the newly constructed office accommodation are excellent and include a staff restaurant, a system of flexible working hours is also in operation and relocation expenses are available in appropriate cases.

If you would like to discuss this vacancy please telephone Peter Ward on Leicester (0533) 540922, extension 7050. Application forms are available from the Director of Personnel and Management Services, New Walk Centre, Welford Place, Leicester LE1 6ZG, or telephone Leicester (0533) 540922, extension 7084.

Closing date for receipt of application forms is the 20th November, 1978.

LEICESTER
Right at the centre

EUROPE BELGIUM

Analyst / Programmers to Senior Systems Analysts

Excellent starting salary plus relocation expenses

Our client, a major multinetional company, has their Europeen Headquarters in Belgium. They ere currently reviewing their hardware end systems throughout Europe end wish to recruit e number of people to assist in this teek and subsequent development.

The successful epplicents will be besed in Belgium. Although there will be a considereble emount of travel, time ewey from home need not be extensive.

Experience is required in RPGII end commerciel or manufacturing systeme. Knowledge of Order Processing or Inventory Control systems would be a definite edvantage. Most important is flexibility of attitude.

If you have relevant experience, the right personality end like the idea of working in a dynemic internetional environment, we would like to meet you. The positions offered are genuinely exciting.

Initiel interviews will be conducted in London and there will be an opportunity to visit our client's European Headquerters for selected epplicants.

Ref. 2039/CW

Computing Services Association

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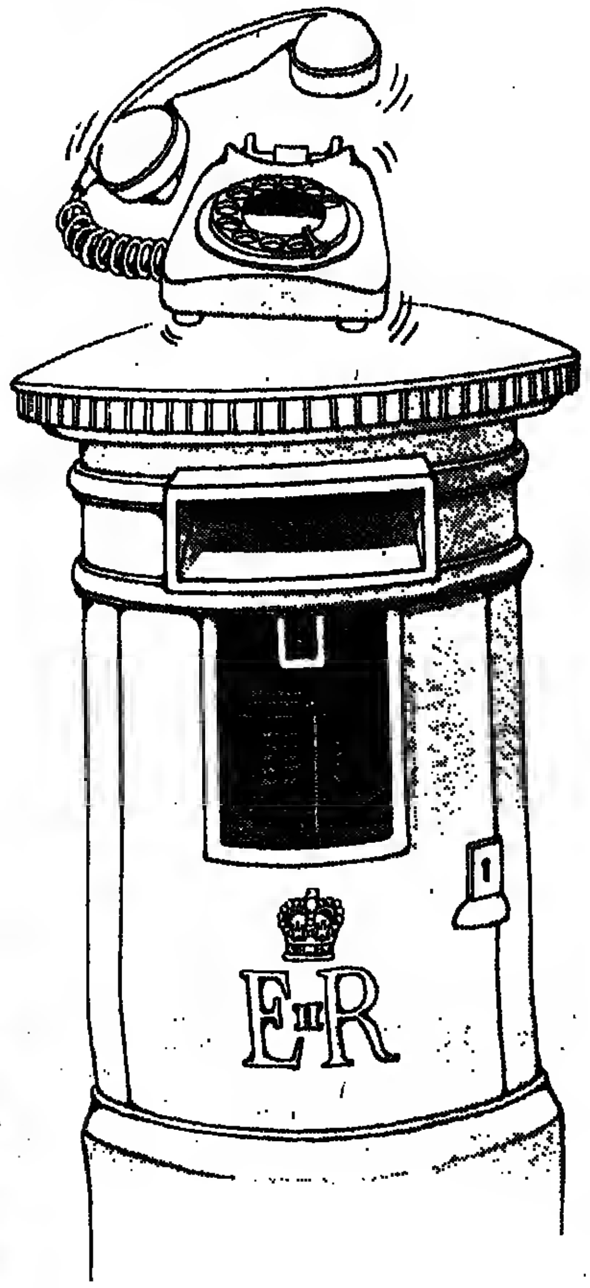

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Candidates for the post should have at least two years' experience of GEORGE 3, or at least one year's experience of VME/B.

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Application forms and further details may be obtained from

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13 Banbury Road
Oxford OX2 6NN
Telephone Oxford 56721

Closing date for applications 27 November 1978

BIRKBECK AND IMPERIAL COLLEGES (UNIVERSITY OF LONDON)

Research Officer in Interactive Computer Graphics

Applications are invited for a three-year post funded by the Science Research Council to work jointly with Professor D. M. Blow and Professor T. L. Blundell in the development of interactive computer graphics for structural analysis of biological systems including proteins, drug molecules and macromolecule-water interactions.

The hardware includes an Evans and Sutherland Picture System II driven by a PDP 11/60 computer linked to an IBM 370/165 mainframe computer.

Applicants should have postgraduate experience in computing preferably with knowledge of mini computers.

Salary according to qualifications and experience, within Grade 1A, entry point not exceeding £4,418 plus London Weighting £450.

Applications to Professor T. L. Blundell, Department of Crystallography, Birkbeck College, Malet Street, London WC1E 7HX, telephone no 01-580 6622.

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Computer and Audit Division

Computer Auditor

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Applicants, male or female, for this newly created post can be auditors with a sound knowledge of computing or practitioners in computing or systems analysis with a good understanding in auditing. The Head of Computer and Audit attaches importance to the need for raising the level of computer auditing, and the postholder will have ample scope to exercise skill, initiative and collaboration with colleagues in Hackney, the other participating boroughs and at LOLA.

Application forms available from Head of Borough Personnel and Secretarial Services, Town Hall E8 1EA, or telephone 986 6278 (24 hour Ansaphone service) quoting reference 0578/CW.
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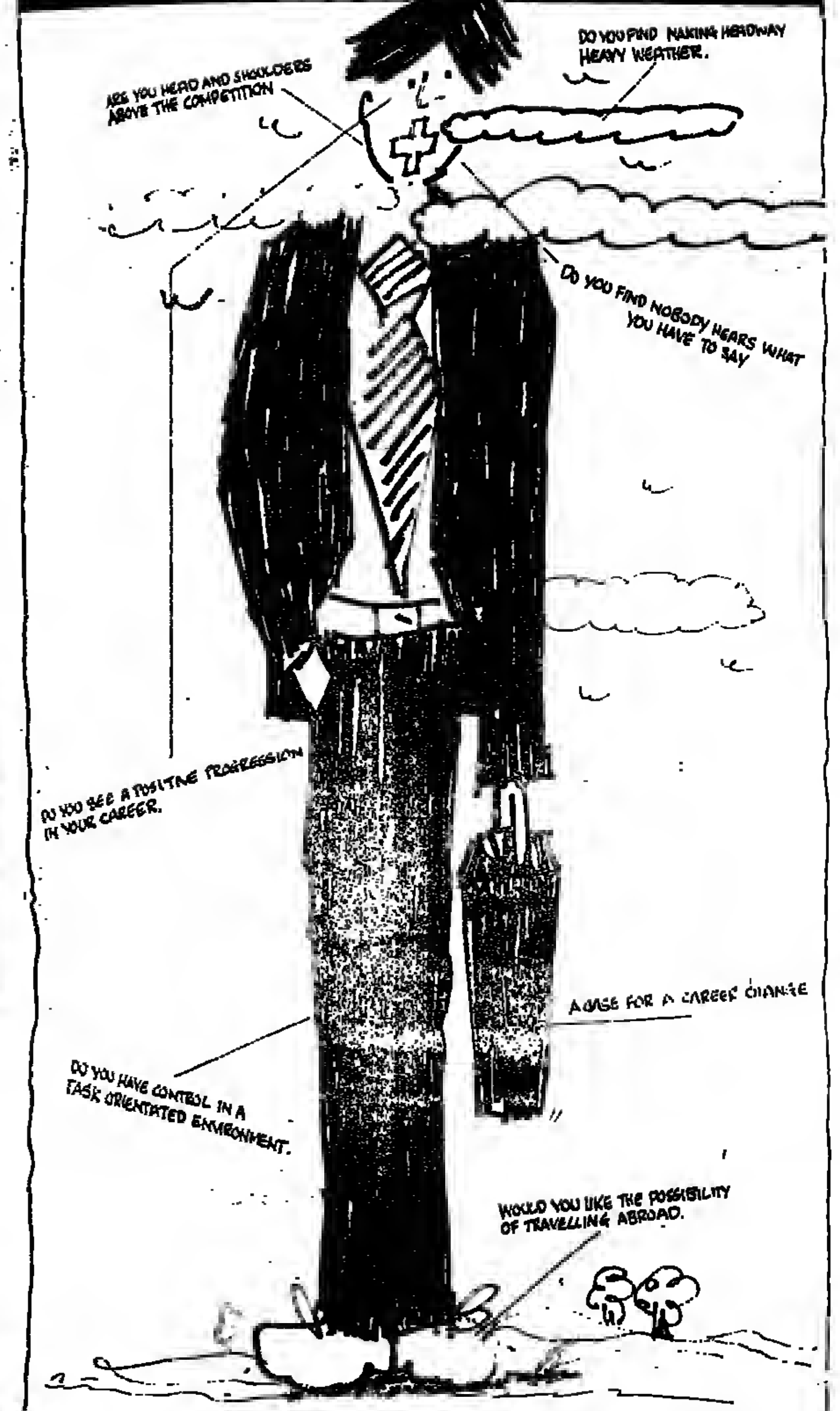

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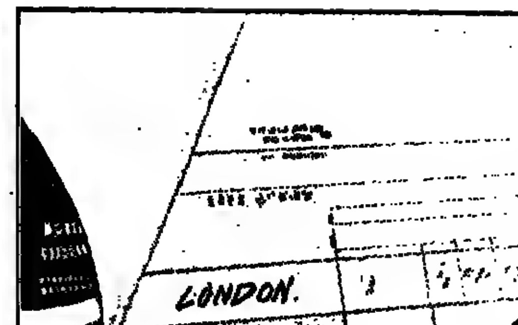
All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication. If complete artwork is supplied 12 noon on a Tuesday. Ring Ian Carter for further details on 01-261 8016.



Your DP experience will travel faster by helicopter

On behalf of Bell Helicopter International, IAL are recruiting data processing professionals for a two-year contract in Iran. It is an exciting project, involving the supply of a logistics and training support service to the Imperial Iranian Army Aviation and demanding extensive data processing facilities.

A large integrated data base has already been established housing the flexible Honeywell 6000 system and the wide cross-section of DP talent we require will certainly benefit from two years in Iran.

Programmer Analyst

Four years' experience is required with at least two years of recent Honeywell experience, utilising COBOL 68 and Integrated Data Store (IDS) programming language.

Software Analyst

Two to five years' experience is desirable in the area of software support and maintenance for Honeywell's GCOS and TSS, GMAP programming.

Data Base Analyst

Two years' recent experience is required in designing and maintaining data bases, utilising IDS utilities. Knowledge of IDS internals is desirable.

Teleprocessing Analyst

Three years' experience is required in the area of software support and maintenance for Honeywell's TDS. Knowledge of GRTS/NPS and GMAP programming.

Systems Analyst

Broad experience is required in defining user requirements for the development of data processing systems/program specifications in the area of financial or aerospace engineering and production systems.

As part of the Bell Helicopter International team, experience is not the only benefit you will derive from a two-year contract.

You will also receive a tax-free salary, a housing supplement of £365 per month plus a child allowance of £480 pa if accompanied. In addition, generous relocation assistance will help you make the transition from the UK and there are free flights home with leave arrangements.

There is nothing to lose and plenty to gain from spending two years in Iran, so write with brief cv quoting ref. no. 7758 to The Recruitment Officer, IAC, Aeradio House, Hayes Road, Southall, Middlesex. Tel: 01-574 5021.

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Wellcome

H.N.C. in Computer Studies? or Computer Experience?

This is an excellent career opportunity for a young man or woman, preferably with H.N.C. qualifications in Computer Studies, to gain wide-ranging programming experience within the Scientific Computing Section of The Wellcome Research Laboratories, Berkhamsted.

Main responsibility will be the development of systems to handle data generated by the Laboratory's Toxicology Section on a PDP 11V03 and to provide a trial/data management system on an IBM 370.

Knowledge of FORTRAN is essential and a knowledge of PDP MACRO would be an advantage. After initial comprehensive training increased involvement in other systems is envisaged.

The Laboratories are part of The Wellcome Group Research and Development and are concerned with veterinary pharmaceuticals and control of insect pests. They are situated on the outskirts of Berkhamsted.

We offer an attractive salary and first-class benefits include generous assistance with relocation expenses, where appropriate.

If you are interested, please write or telephone for an application form, quoting reference LAC 50, to.
A. J. Morris
Site Personnel Officer
The Wellcome Foundation Ltd.
Berkhamsted, Herts.
Tel Berkhamsted 3333 ext: 363

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LAMBDA Technology Incorporated, a large innovative computer service company, is seeking qualified individuals for unique temporary employment opportunities (one-two years) at our New York, San Francisco and Los Angeles offices.

We require individuals at all levels of expertise in any of the following.

★ COBOL, PL/1, ASSEMBLER, MINI/MICRO
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Salaries are fully attuned to experience, background and ability in addition to our own benefits package. We will also reimburse round-trip relocation expenses.

If you are interested in an interview during the week of November 12-17, please contact Steven Greller.

Churchill Hotel, Portman Square. Telephone: 01-486 5800 on November 10-12

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SYCS Analyst Programmer. O.S. or DOS with either COBOL or Assembler experience. Central London based, salary dependent on experience to £7,250. Financial systems background preferred but not essential.

CORAL 66 Systems Designer for a 9 months Poole based contract. Rate from £265 p.w. PDP background an advantage. Software or technical preferred.

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OXFORDSHIRE — Micro specialists Intel 8080, Zilog Z80 required by multi-national franchise holder. Recently formed U.K. Company can offer outstanding career positions. Salaries to £8K.

BRUSSELS — T.P. and D.B. Applications and Software Programmers. Prefer IBM software. Full relocation expenses and wide range of real company benefits whilst salaries to £18K. Interviews at our London office.

MATRIX

Telephone 01-491 4636 (10 Lines)
360 Oxford St. London W1N 9HA.

HEX PAUSES

Because of pressure on space The Hexadecimal Kid is taking an enforced rest this week. He'll be back!

Puzzle Answer

THE only possible set of triplets is: 123, 147, 159, 168, 249, 258, 267, 348, 357, 369, 456, 789.

STRATHCLYDE REGIONAL COUNCIL

DEPARTMENT OF EDUCATION
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FULL-TIME LECTURER 'A' IN COMPUTER STUDIES

Candidates will be required to demonstrate a specialist interest in, and relevant experience of, either SYSTEMS ANALYSIS and DESIGN or COMPUTER SCIENCE and should have academic and professional qualifications appropriate to the teaching of their specialisation at degree and post-graduate level.

PART-TIME LECTURER 'A' IN COMPUTER STUDIES

Applications are invited from suitably qualified persons with experience in commercial computing and a good knowledge of COBOL for the above post

Teaching training would be an advantage but training can be given on an in-service basis

Salary Scale:
Lecturer 'A' — £4028-£7110 Bar — £7838.
Placing on the salary scale will be given for relevant experience.

Forms of application and further particulars can be obtained from the College to whom completed application forms should be returned not later than 24th November, 1978.

EDWARD MILLER
Director of Education

RESPONSIBILITY FOR SYSTEMS at BANKERS TRUST INTERNATIONAL LTD.

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Cripps, Sears

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We have an H604D, Tape, Disc and DATANET 355.

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Applicants should either telephone or apply in writing to Mr. Les McLean, Manager of Computer Operations, British Relay Limited, Overline House, Station Way, Crawley, West Sussex. Telephone: Crawley (0293) 31281.

british relay

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With us, real-time software is at the heart of some of the world's most advanced flying radar systems. For example, in the AEW Nimrod system, the on-board computer interacts with the radar to make sense of the mass of data it receives. It's much the same with another of our systems, for the ADV Tornado. The whole concept of both these systems is new; so is much of the technology.

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You'd be part of our own informal software house, with over £1 million worth of GEC mainframes.

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There can't be many software jobs that offer you both.

To find out more about Airborne Software at Marconi Avionics, and the part you could play in it, phone Norma Coulter on 01-953 2030, ext. 3771 or write to H. E. Batchelder, Marconi Avionics Limited, Elstree Way, Borehamwood, Herts. Quote reference MA 78120.

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North of England – Ken Bentley – Tel: 061-477 5140.
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The successful applicant will be responsible to the D P Manager for the operation of our IBM system/32 which is currently under review for up grading. He/she will supervise a staff of seven covering all aspects of operating data control and data preparation.

Applicants should be educated to A level standard and have at least five years relevant experience in the computer field. The ability to motivate and manage staff often working under pressure is essential allied to a flexible approach to their own work programme.

Salary is negotiable and a contributory pension and life assurance scheme is in operation.

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A competitive salary is offered, and fringe benefits will include free life insurance and generous relocation assistance where appropriate. If you have the necessary qualifications and experience, and are seeking a challenging and rewarding career with a forward-looking Company, please apply in writing, giving brief personal and career details to:

Keith Middleton,
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The initial salary will be within the range circa £7,182 to £8,457 per annum inclusive of a Metropolitan Weighting allowance and the post is designated Principal Auditor.

Further details may be obtained by contacting Chee Jones (ext. 8205) on 01-688 4488. Written applications quoting Ref: F.4736 giving full details of experience and qualifications to the Director of Personnel, SEGAS, Segas House, Katharine Street, Croydon CR9 1JU within 7 days.

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To £8k +

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A B EXECUTIVE (Bristol) Ltd — Consultants

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MATRIX

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To take over from existing supervisor in a busy computer bureau in Exeter which is currently using Univac punch card machines.

A thorough knowledge of Data Prep machines is necessary and previous supervisory experience is desirable.

Please write to Miss Joy Stevis, Western Data Processing Ltd., 7/8 Colleton Crescent Exeter, Devon. Phone 34131.

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For further details, or to arrange an interview, telephone our Projects Managers, either Geoff Bodycote (Ext. 255) or Bob Berry (Ext. 256). If you wish to telephone in the evening, Geoff can be contacted on Sutton Elms 283023 and Bob on Leicester 865763.

British Shoe Corporation, Sunningdale Road, Leicester Tel. Leicester (0533) 871355

Contract Programmers-Analysts

If you are thinking of doing contract work why not start here by registering now for immediate and forthcoming requirements.

For further details contact: Bridget Kotchie

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We've programmed our expansion — will you help us to programme our equipment?

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Your interests will lie in automation and the use of modern mini-computers and microprocessors in dedicated control applications. This is a unique opportunity to deal with computer control projects at all levels from formulating customers' requirements to system implementation and installation.

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At H.S.D.E. you will work in small multi-discipline engineering teams exercising your talents and proving your experience of advanced microprocessor and distributive processing systems.

Applications include marine propulsion controls, aircraft engine control systems, coal clearance automation and underground data transmission monitoring systems for the mining industry.

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Applications should be addressed to: Mrs D. Alvi, Personnel Officer, Hawker Siddeley Dynamics Engineering Limited, Manor Road, Hatfield, Herts. AL10 9LP. Telephone 88234, ext. 488.

HAWKER SIDDELEY GROUP SUPPLIES ELECTRICAL AND MECHANICAL EQUIPMENT WITH WORLD-WIDE SALES AND SERVICE

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Sudan — *US $19,400 after tax*

The Kennna Sugar Company Limited in central Sudan has developed into one of the world's largest irrigated sugar estates. The Company has installed two NCR 8250 computer systems using magnetic discs and VDU terminals for direct data entry. Systems currently under development cover stores, analysis of costs and payroll to be followed by analysis of expenses and assets. The work involves maintenance and modification of these systems and the development of new systems.

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The working language is English.

Excellent conditions of service include:
- salary US $19,400 plus 15% end of contract gratuity and discretionary incentive bonus all free of tax
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Form application form and for further details about the Company please write in confidence to, David Prosser, Executive Selection Division, Southwark Towers, 32 London Bridge Street, London SE1 9SY. Ref: MCB/8725

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